McGraw Hill Publishing Company, Inc.,
New York, N.Y.

TECHNOLOGY DEPARTMENT
First Copy

Construction Methods

July 1929

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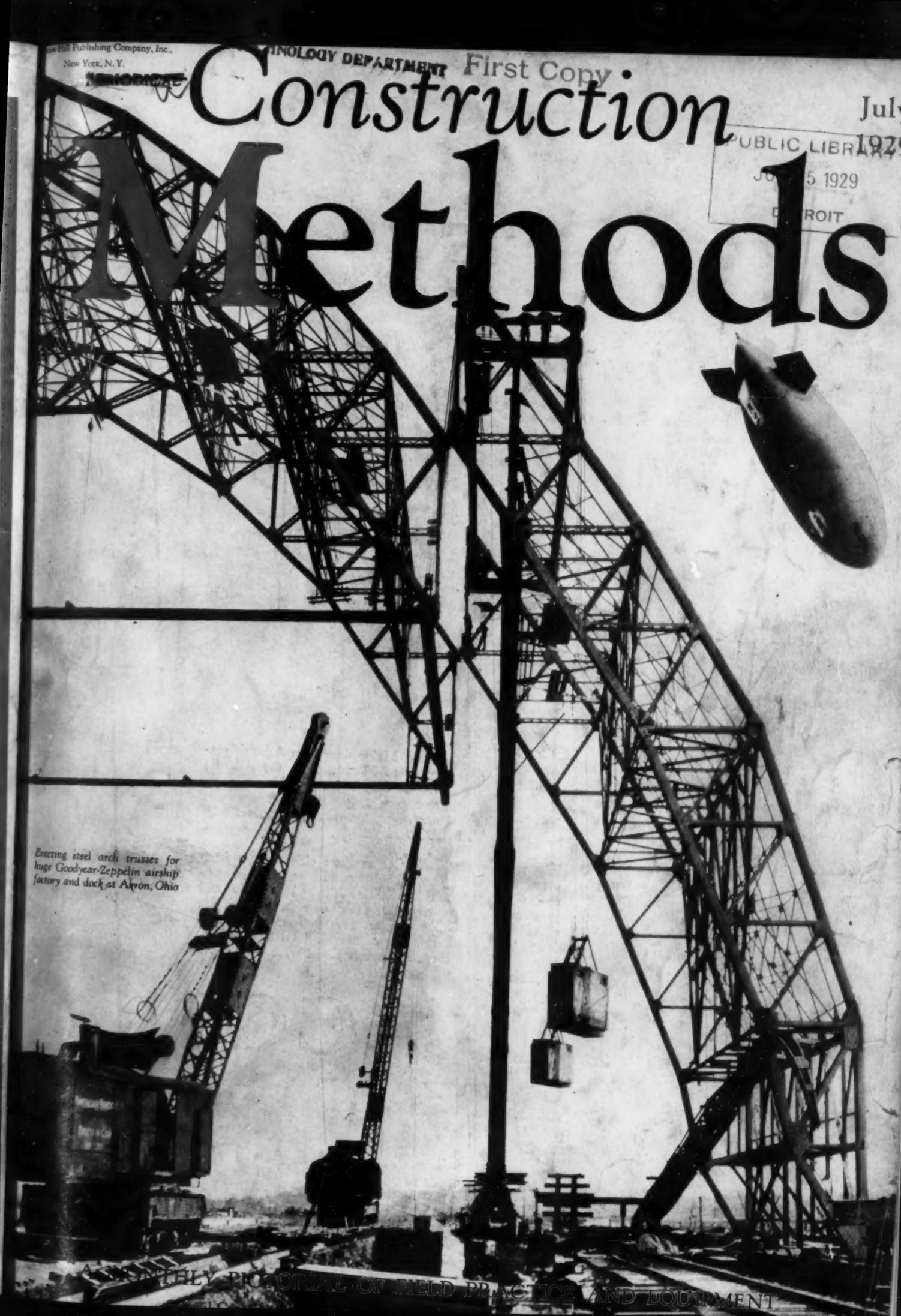

Erecting steel arch trusses for huge Goodyear-Zeppelin airship factory and dock at Akron, Ohio

A MONTHLY PICTORIAL OF FIELD PRACTICE AND EQUIPMENT

Constructing TEXACO All-Asphalt pavement on Third Avenue, Hutchinson, Kansas. A 3½-in. black base was covered by a 1½-in. sheet asphalt top.

One of 1450

From Maine down the Atlantic seaboard to Florida, from the Atlantic Ocean west to the Rockies, a great and growing group of representative American cities and towns have provided themselves with pavements of TEXACO Asphalt.

The yardage of TEXACO in these cities ranges from a few thousand to several million. Many of these communities pave with TEXACO Asphalt year in and year out. They consider their smooth, easy-riding, durable TEXACO pavements among their chief assets. Hutchinson, Kansas, is one of the 1450 U. S. cities and towns, in which there are streets paved with TEXACO Asphalt.

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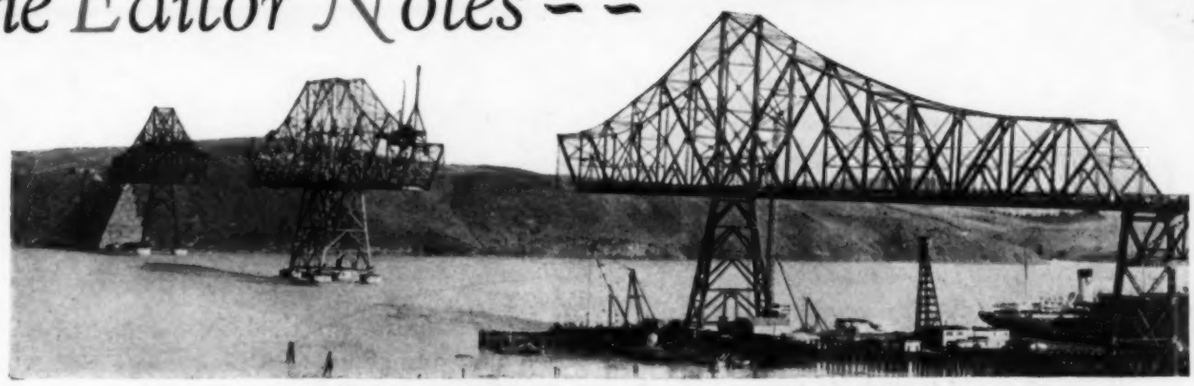
TECHNOLOGY DEPT

The Editor Notes - -



Hoist Signals and Safety

IN THE interest of safety the employment of experienced signalmen on material hoists has been endorsed by the sub-committee on accident prevention of the Building Trades Employers Association, New York. Sub-contractors are often reluctant to take over experienced signalmen from general contractors whose hoists they may be using. Failure to do so not only endangers life on a new building through the use of an inexperienced bellman—generally a common laborer—but has resulted in a number of serious injuries that could have been avoided. In building tall structures material must be distributed on as many as ten floors during the course of erection. Under these conditions a trained signalman is an indispensable member of the construction crew.

Asphalt Repairs

Maintenance and repair work on asphalt paved streets in Syracuse, N. Y., has been carried on far more systematically and promptly since the purchase of a mobile asphalt repair plant at relatively low cost. Previously, according to Nelson F. Pitts, Jr., city engineer, it had been the custom, after the 5-year guarantee had expired, to let out repair work to contractors. They were not always willing to move their machinery for the repair of small defects and holes. The purchase of the city-owned repair plant has proved to be a good investment.

Guaranteed Building

Something new in the form of a building guarantee has been adopted by the H. K. Ferguson Co., of Cleveland. Every lump-sum contract undertaken by the organization on plans and specifications which it has prepared or approved for guarantee now includes this clause: "The builder guarantees the work against defective workmanship and material for a period of five years after date of completion." Ordinarily where a contractor's guarantee is given, it covers a period of not more than one year. Regular inspections at least once a year are included in the new five-year guarantee plan.

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Bidding Restrictions

Iowa's highway contracts and specifications this year contain two new restrictions designed to eliminate irresponsible or incompetent bidders: (1) In no event will the commission award contracts involving more than 12 miles of pavement to any bidder who has not satisfactorily completed a contract for paving upon the primary road system of the state. (2) Any bidder who has failed to comply with the provisions of any state contract or who has taken an unreasonably long time to complete a contract shall not be considered qualified to bid.

CONSTRUCTION METHODS

A monthly review of modern construction practice and equipment

PUBLISHED BY
McGRAW-HILL PUBLISHING COMPANY, INC.
TENTH AVENUE AT 36TH ST., NEW YORK

Big Road Program

WHAT IS characterized by James Lyall Stuart, secretary of highways, as "the most extensive construction and replacement program ever launched in the history of Pennsylvania" will be undertaken by the Department of Highways in building 1,800 miles of improved roads during the two years beginning June 1. The work is authorized and funds provided by legislation recently enacted.

Color in Construction

The current mode for color, manifest today in such objects as scarlet frying pans and green bath-tubs, has made its entry into the field of building construction. A New York skyscraper is being erected of steel members painted a bright yellow to advertise the work of a local fabricator. The Hay Foundry & Iron Works is the organization that has decided to break with tradition in using a distinctive coloring for structural steel.

For Emergency Use

Many costly delays on the job are due to the absence of some individual on whom rests responsibility for giving an order or making a decision. To avoid situations of this sort, H. K. Davis, chief inspector of the Iowa State Highway Commission makes this valuable suggestion: Let superintendent, foreman, resident engineer and inspector mutually exchange addresses and telephone numbers at the beginning of a job and arrange a method of finding each other on short notice when something is needed in a hurry.

Accident Prevention

Specific examples of how safety principles have been applied to construction in California are illustrated on p. 40. *Other photos of this sort are wanted by the Editor.*

What Makes Construction Methods?

WHAT makes an industrial paper, anyway? What is it that translates so many pounds of paper and ink into a readable publication, that transforms so many pages of type and cuts into a live and going journal that can win the recognition of the industry it seeks to serve?

Good typography? Yes. Attractive layout? Yes. A store of useful facts and ideas? Yes, all these are important. But, after all, they are superficial. The full answer must be sought somewhere back of the more obvious aspects.

First, it is essential that a journal live *for* its industry rather than *off* its industry, that it live to meet the need of the industry rather than the need of the publisher. Next it must define a clear-cut editorial purpose. Then must follow intelligent and resourceful editorial direction that will search out the significant needs of its readers. And, finally, it must know how to present all these in a form that will appeal to its readers, that will most effectively economize their time and effort.

If all this be done honestly, skillfully and consistently, a journal comes in time to develop a personality. To its readers it becomes an understanding and sympathetic friend rather than just so much printed matter. It enjoys their respect and confidence on exactly the same basis as do their human friends, that of mutual understanding and helpfulness.

It is just this breathing of life into inert paper and ink, this achievement of a personal relationship with the reader that constitutes the supreme accomplishment of journalism in whatever field.

In this journalistic faith *Construction Methods* was born and has been bred. Whatever progress it may have made to date, whatever it may eventually achieve, will be measured by the clarity of our vision of these principles and our skill to apply them wisely in the service of construction men everywhere.

Willard Chevalier
Publishing Director

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Electrical West
(Published in San Francisco)
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(Published in London)

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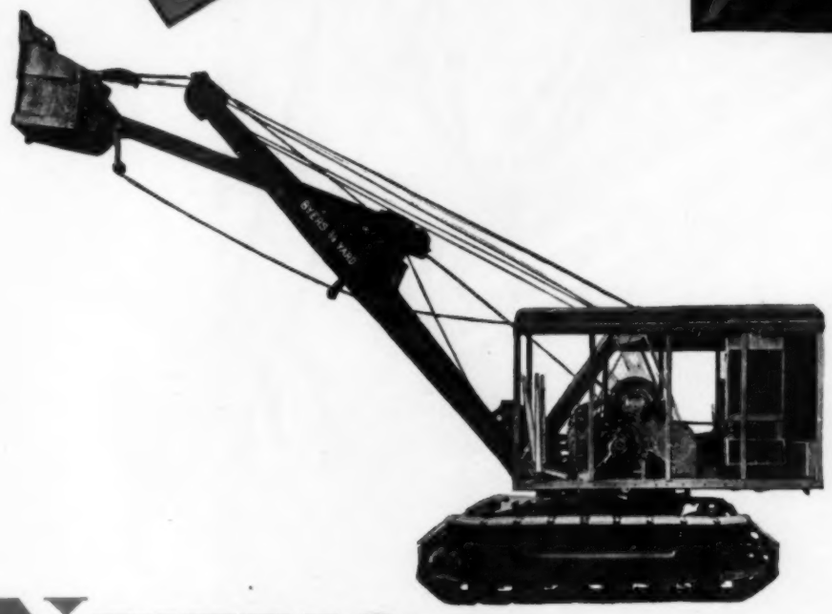

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A Technical Service Bureau is at the disposal of architects, engineers, owners and others who have need of any information which can be supplied through the American Institute of Steel Construction, Inc.

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The co-operative non-profit service organization of the structural steel industry of the United States and Canada. Correspondence is invited. 200 Madison Avenue, New York City. District offices in New York, Worcester, Philadelphia, Birmingham, Cleveland, Chicago, Milwaukee, St. Louis, Topeka, Dallas and San Francisco.

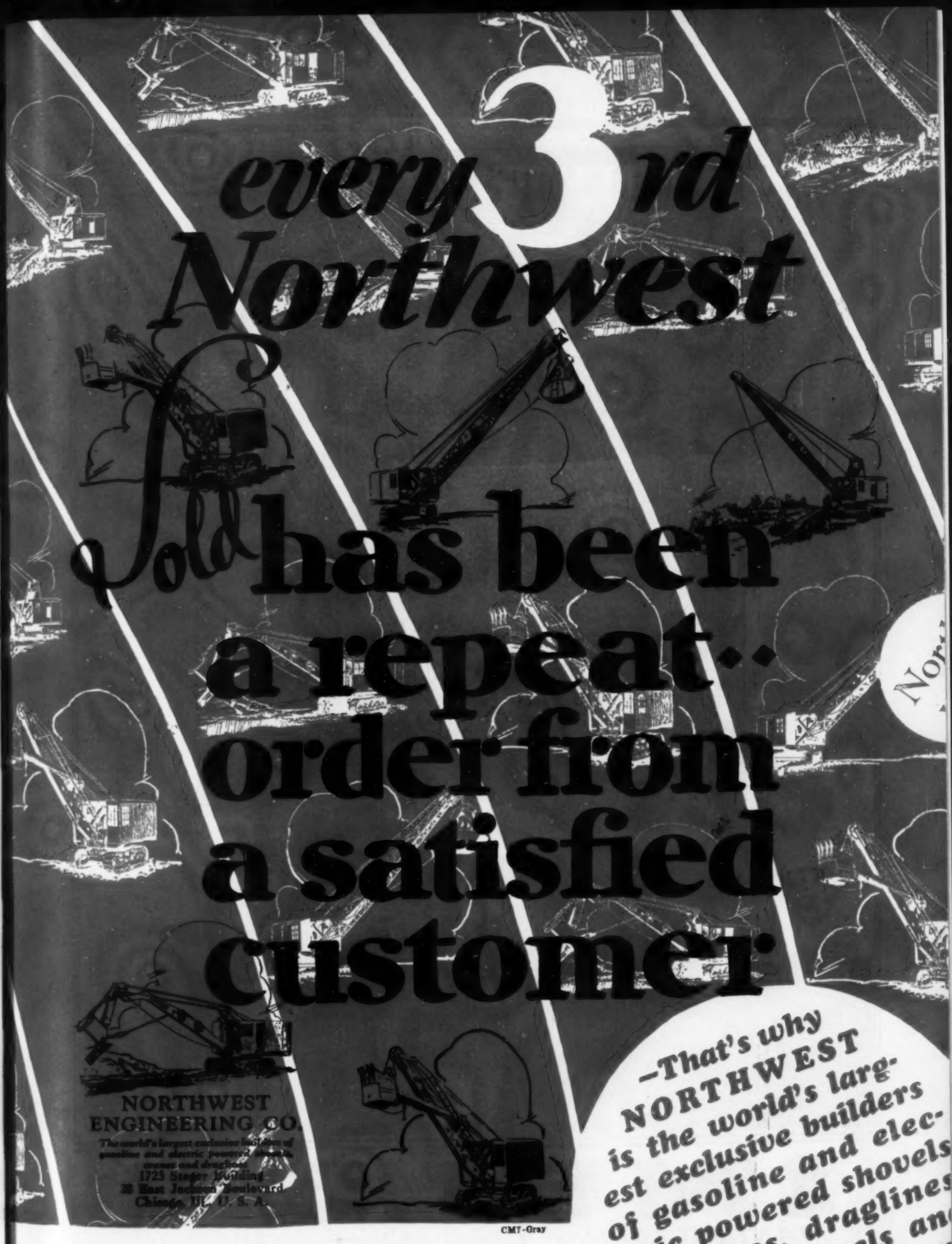
The Institute publishes twelve booklets,

STEEL

INSURES STRENGTH

AND SECURITY

one on practically every type of steel structure, and provides also in one volume, "The Standard Specification for Structural Steel for Buildings," "The Standard Specification for Fire-proofing Structural Steel Buildings," and "The Code of Standard Practice." Any or all of these may be had without charge, simply by addressing the Institute at any of its offices.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The Insley Type "R" sets a standard of value hitherto unknown in the half-yard shovel field. It has many new and outstanding features the value of which are demonstrated by performance.

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The price of the Type "R" Insley is reasonable. In fact, it is low when the construction of the machine and its outstanding performance is considered. Find out about it. See one in operation, see how well it is made and how well it works, and then you will realize that it sets a new standard of half-yard shovel value.

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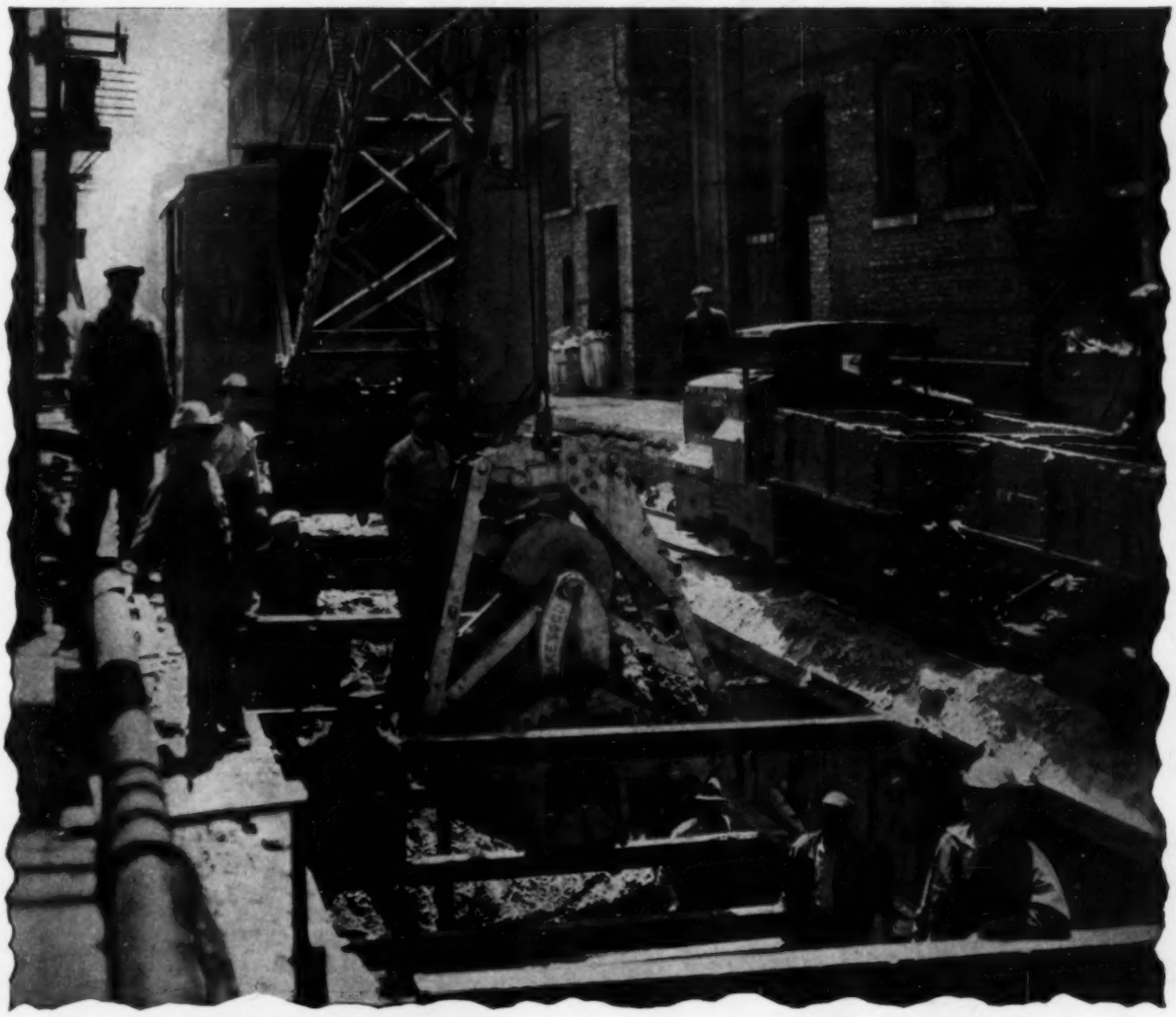
LAKEWOOD CONSTRUCTION EQUIPMENT



Digging Down—*All the Time*

every Lakewood BITE *pays*

is no idle theory with the New Lakewood Clamshell. The greater power ratio near the end of the stroke forces the shells down at the moment that counts most in getting a full load. The many other added advantages in the New Lakewood makes this bucket the first determined advance in Clamshell design.

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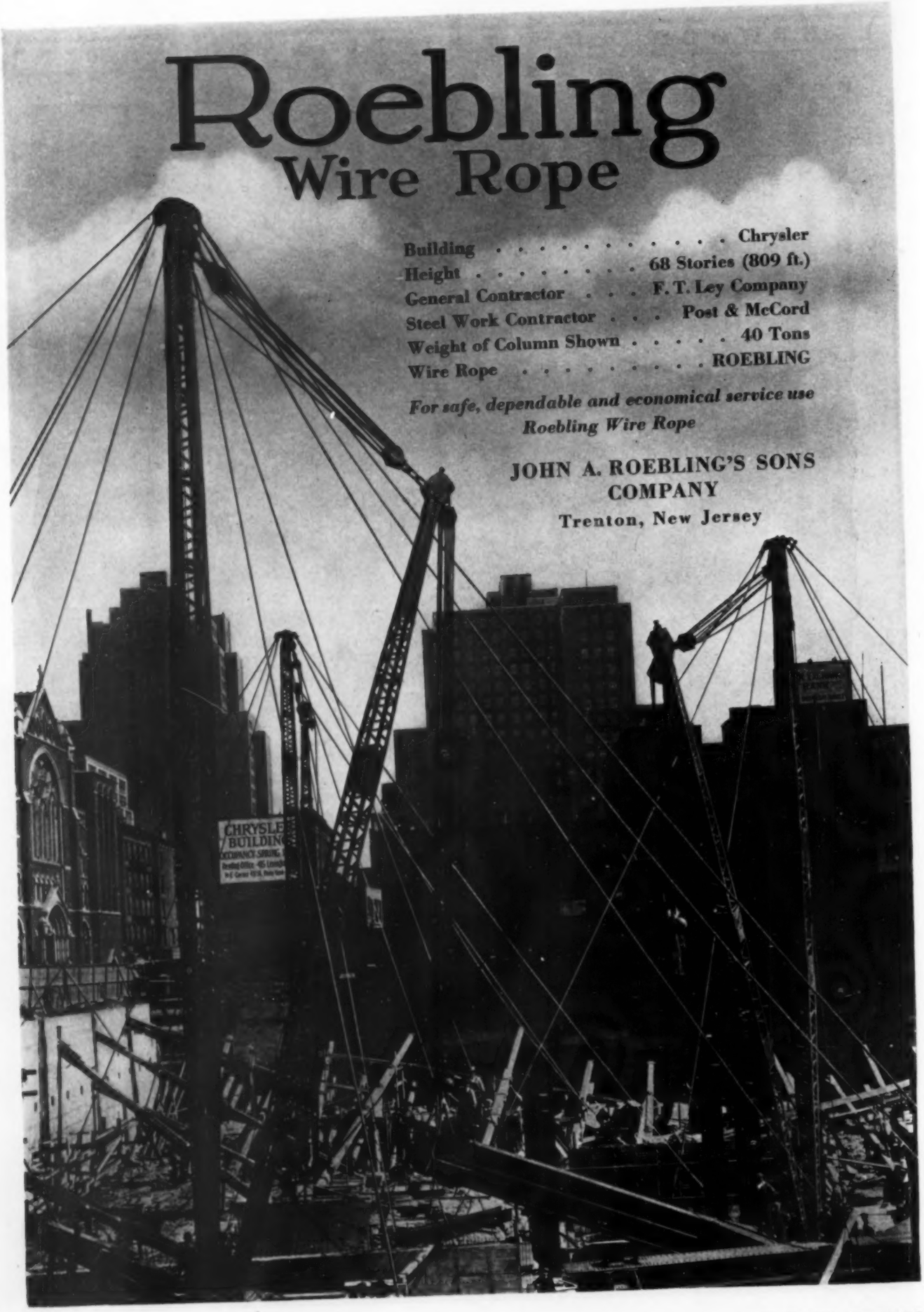
Roebling
Wire Rope



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Height	68 Stories (809 ft.)
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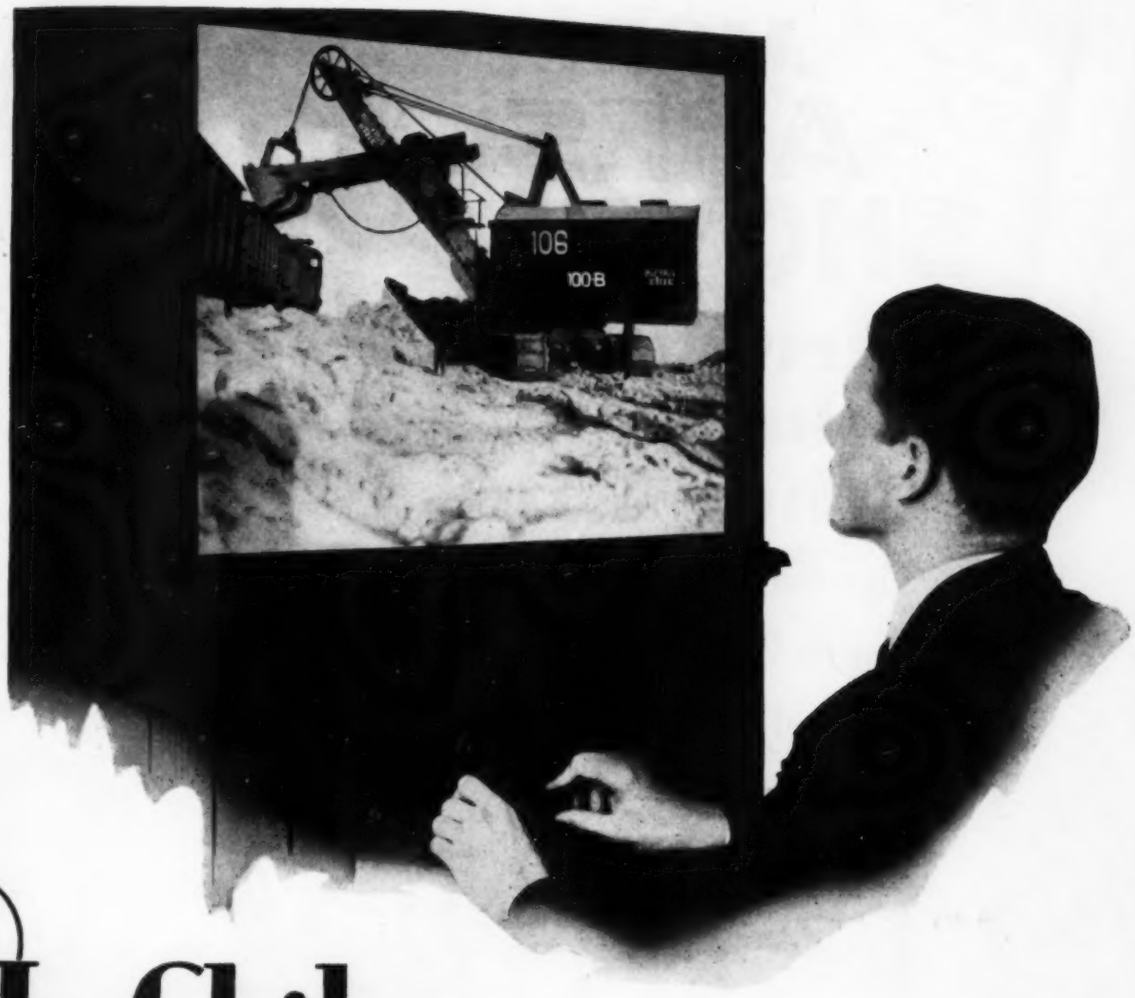

In Chile—

3,500 miles from the factory—
BUCYRUS-ERIE *reliability* again shows its value

If by the magic of television you could watch the operations at the mines of the Anglo Chilean Consolidated Nitrate Corporation, you'd see 20 BUCYRUS-ERIES slashing through the hard nitrate composition.

These powerful diggers—14 BUCYRUS-ERIE heavy duty 3-yd. and 4-yd. electrics, and 6 Diesels—were chosen because of the unequalled *Reliability* of BUCYRUS-ERIES.

The owners need not worry about the many miles separating these mines from the plant where their shovels were built. They know from experience that the greater sturdiness of BUCYRUS-ERIES keeps them working steadily month after month, with minimum maintenance.

All over the world, you find big quarrying and mining operations being carried through successfully because of the reliability of BUCYRUS-ERIES.

The greater strength of BUCYRUS-ERIES is an asset in *any* location

—and you find this extra sturdiness in the complete line, from the ½-yd. gasoline outfit to the mammoth 16-yd. electric stripper, the world's largest shovel.

Write us—we'll be glad to send performance records showing what BUCYRUS-ERIES have done on work like yours.

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The complete "All Star" Ames line covers every shovel need.

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A Mouthful At Every Bite
. . . And Short Work of Every Job!
The Owen Type "M" Bucket, illustrated on this page, meets practically all requirements for general purpose digging bucket duty—excavating, dredging and rehandling. It's a sturdy, dependable, handy bucket for work in any kind of materials. It is recommended especially to contractors. Built with ample weight for efficient digging power—and, at the same time, for fast operation. A never failing producer of "A Bigger Day's Work."
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"Anchor" Puller-jack

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"The Tool of a Thousand Uses"

COSTS ONLY $36 COMPLETE

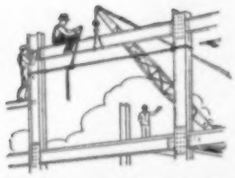
DOES AS MUCH AS 36 MEN

Patent Applied For

Sheave Block included in standard equipment; used to double the pulling power, or in making vertical lifts, pulling around corners, or in cramped quarters.

A One-Man Gang

ANEW, a quicker, cheaper way to handle the jobs of pulling, moving, lifting heavy loads. For most purposes the "Anchor" Puller-jack does the work of chain hoists, lifting jacks, winches, and block and tackle. Lighter than any.



On structural steel work, your "Anchor" Puller-jack pulls and holds members in place for assembling. Also pulls together concrete forms, coffer-dams, etc.

Tightens guy wires on derricks and towers, stretches into place aerial cable ways. Used for wrecking, pulling down walls and structures, moving buildings.

When a loaded truck is ditched or mired, get it going with your "Anchor" Puller-jack. One man does the trick. Also used for warping and handling barges and scows.

On dumps, in quarries and pits, one man with an "Anchor" Puller-jack can move and shift your track anywhere.

Broken conveyor pulled together for splicing. Similarly used on ropes, belts, chains and bucket elevators.

Built Like a Battleship

Standard outfit consists of the machine itself with 3-ft. steel handle, 15-ft. load chain with slip-hook and swivel, 3½-ft. tail chain with grab hook, and sheave block.

The chains are special-made of high carbon steel, heat treated; provides a high factor of safety, will not stretch out of shape.

Sure as a Pinch Bar

The "Anchor" Puller-jack is simple, fool-proof; practically nothing to get out of order. Positive action; always holds. Will not clog with dirt. Built to withstand roughest handling. One man with an "Anchor" Puller-jack does the work of a gang.

Simple as a Sledge

Can be operated in any position—lever upright, upside-down, or sideways; with lever pull toward the load or from it. No instructions are necessary—the "Anchor" Puller-jack cannot be used wrong.

The "Anchor" Puller-jack is only a small machine, but it shouts with a 5-ton voice.

You'll need it the day it gets on the job.

A one-man outfit; easily carried, easily operated, does the job.

A Strong Pull—A Long Pull

Pulls the length of the load chain without taking a new hold. 15-ft. chain is standard equipment; special lengths as ordered. Quick release lock enables the load to be instantly released under full strain.

A 5-Ton Pull

Certified tests by Pittsburgh Testing Laboratory, Pittsburgh, Pa.,

STRAIGHT LINE PULL

One man pulled 4800 lbs.
Two men pulled 6500 lbs.

WITH THE SHEAVE BLOCK

One man pulled 6700 lbs.
Two men pulled 9800 lbs.

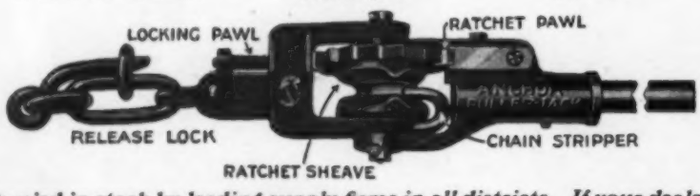
Tests made with a stock "Anchor" Puller-jack equipped with standard 3-ft. lever; men stood on concrete floor. Out on the job men can dig in their feet and get a real pull.

Order Today—

You'll use it every day

"Anchor" Puller-jack, complete as described, $36 f.o.b. our works, Reynoldsville, Pa. Shipping weight 82 lbs. Extra length load chain, quoted on request. Crated for overseas shipment, $1 extra.

$36



Carried in stock by leading supply firms in all districts. If your dealer cannot furnish the "Anchor" Puller-jack, order direct from us. Immediate Shipment.

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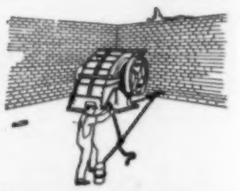
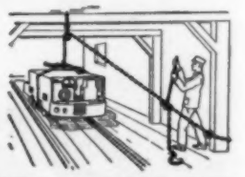
Oliver Building Pittsburgh, Pa.

Also Manufacturers of "Anchor" Track Braces and "Anchor" Rerailers

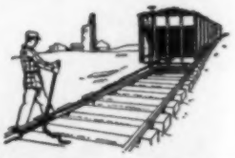


Using the sheave block in setting a heavy crusher against a wall. The "Anchor" Puller-jack is a labor-saver on every construction job.

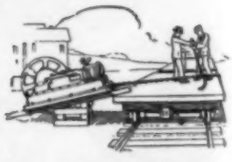


Lifts heavy machinery. Sheave block as used on a lifting job with "Anchor" Puller-jack.

Back on the track in a jiffy; don't wait for the locomotive. Lever works in any position. That's the "Anchor" Puller-jack



Spots railroad cars anywhere you want them; handles them loaded, up steep grades, with ease. If partly loaded cars run past the loading point, one man gets 'em back quick.



Loads and unloads heavy machinery. An easy job, and under full control at all times with an "Anchor" Puller-jack.

Wire Rope Durability Saves Wire Rope Dollars

True wire rope economy depends on the amount of yardage a wire rope can handle for each dollar of its cost.

If you would reduce your wire rope expense to a minimum, give "HERCULES" (Red-Strand) Wire Rope a chance to show you what it can do. Try it on your hardest work and keep a record of its relative cost "per unit of work done." Its extensive use is largely due to just such trials.

Made Only by A. Leschen & Sons Rope Co. Established 1857

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Distributors at over 100 different points. The name of our Distributor in any particular locality will be furnished gladly upon request.

BLAW-KNOX *will design and build your*

CENTRAL MIXING PLANT

Contractors have learned to rely upon the experience and ability of Blaw-Knox to furnish *efficient* plants for central mixing and for ready mixed concrete.

A striking example of this Blaw-Knox ability is the 300-ton Weighing BATCHERPLANT of the W. E. Callahan Construction Co.—designed to furnish ready mixed concrete for the construction of the large River des Peres Drain at St. Louis, Mo.

Blaw-Knox has designed thousands of BATCHERPLANTS for construction jobs, large and small, involving the use of Blaw-Knox Volume Batchers; Weighing Batchers; and the well-known Inundation System.

Permit Blaw-Knox to make recommendations for your Central Mixing Plant or Ready Mix Concrete Plant. You will be placed under no obligation if you avail yourself of this engineering service.

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Pittsburgh, Pa.

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Sales and Service Throughout Every Part of the United States.

W. E. Callahan Construction Company's trucks unload ready mixed concrete directly into Blaw-Knox STEEL FORMS, on the River des Peres Drain.

FOR THE SHORT HAUL *or the* 3-HOUR HAUL

WITHOUT SEGREGATION—**the Blaw-Knox AGITATOR Truck Body keeps the batch of ready mixed concrete constantly in circulation by means of revolving blades geared to the truck transmission.** ***The truck operator has absolutely nothing to do with the batch.***

Ready Mixed Concrete

Delivered in

Perfect Condition

The mixing time is extended from the plant to the job. At the delivery point, the concrete is stronger and more workable.

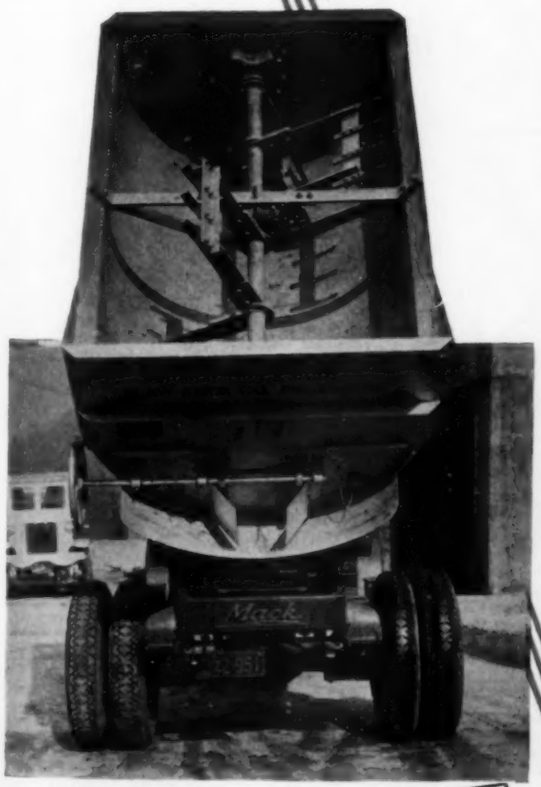
The biggest problem of the ready mixed concrete industry *is solved*—**any truck chassis can be equipped—**

WITH THE

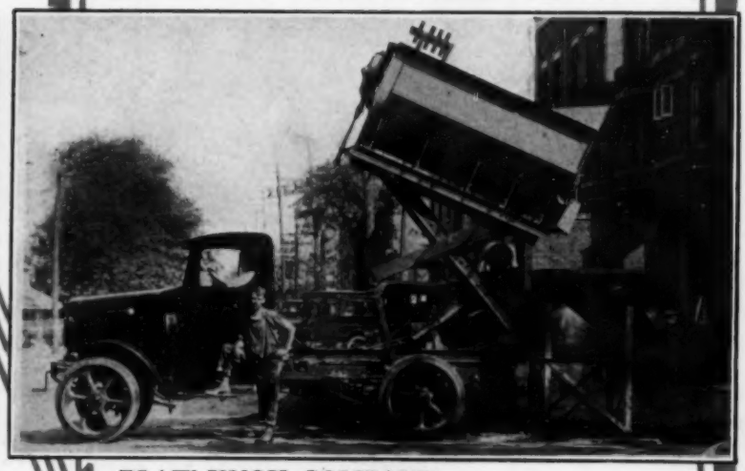
BLAW-KNOX *Agitator* TRUCK BODY

MAIL THE COUPON

The Blaw-Knox Agitator Truck Body can also be used for the general hauling of sand, stone, coal, etc.—without removal of the agitating mechanism.



The Blaw-Knox Agitator Truck Body



BLAW-KNOX COMPANY
686 Farmers Bank Building, Pittsburgh, Pa.

Send me your Bulletin No. 1083—Blaw-Knox AGITATOR Truck Bodies. I am also interested in Blaw-Knox Ready Mixed Concrete Plants.

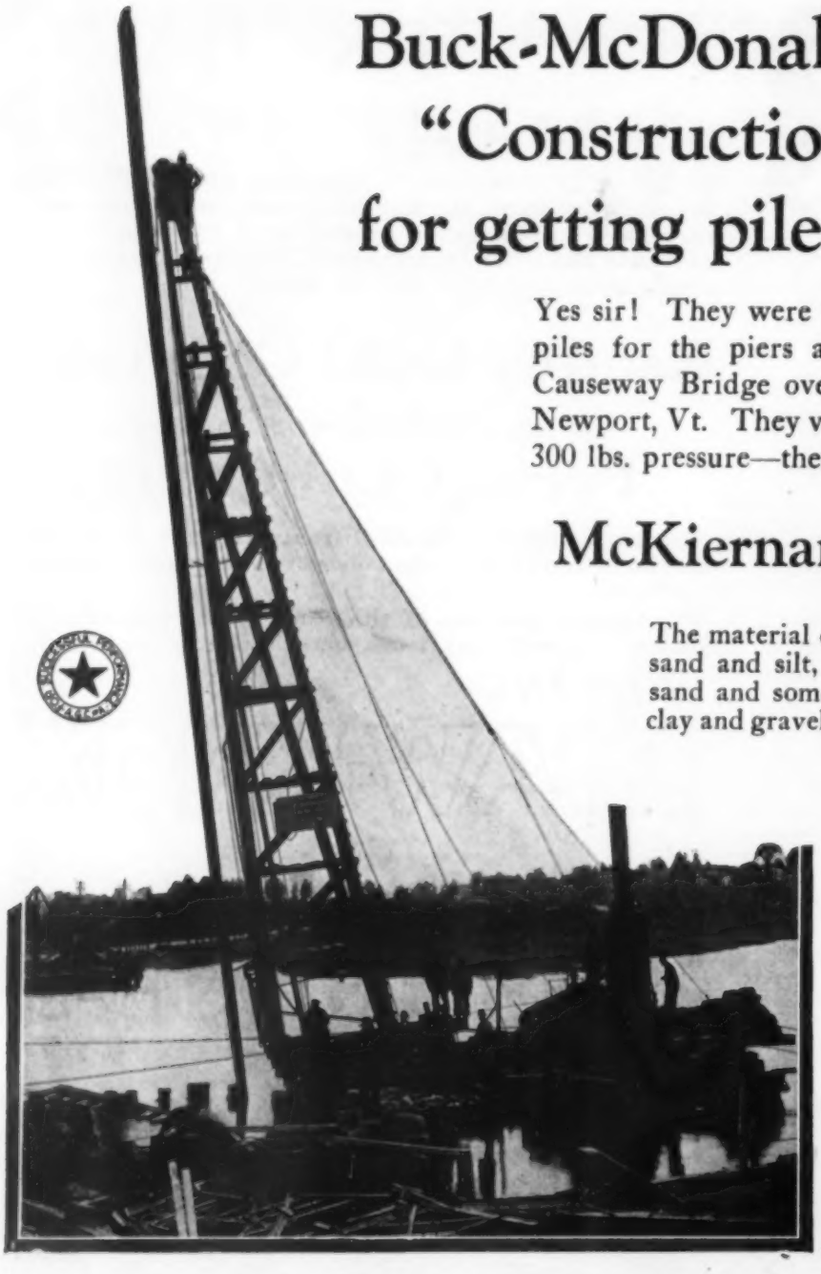
Name _____

Company _____

Street _____

City _____ **State** _____

Buck-McDonald knows good "Construction Methods" for getting piles down fast—



Yes sir! They were up against it, driving 95 ft. piles for the piers and abutments of the New Causeway Bridge over Lake Memphremagog at Newport, Vt. They vainly tried a double job with 300 lbs. pressure—then used

McKiernan-Terry 9-B-2

The material driven in is 20 to 30 ft. of fine sand and silt, 30 to 35 ft. of fine compact sand and some clay and 3 to 8 ft. of sand, clay and gravel, extremely hard driving, penetrating not over 1 inch to 150 to 200 blows (!); below this point; yellow clay, some sand. Each pile driven on a batter of 1 and 2 inches to the foot. McKiernan-Terry Hammers ALWAYS "get the piles down," if a hammer can DO it, even if we have to submerge the hammer itself far under the water.

Have you the latest Catalog?

McKIERNAN-TERRY DRILL COMPANY, 13 Park Row, New York

Pile Hammers and Accessories, Drilling Machinery

Works at Dover, N. J.

E. R. BACON CO.
San Francisco, Calif.
J. W. BATHOLOW CO.
Dallas—Fort Worth, Tex.
BECKWITH MACHINERY CO.
Pittsburgh, Pa.
J. P. BENJAMIN
Jacksonville, Florida
BORCHERT-INGERSOLL, INC.
St. Paul—Duluth, Minn.
BRANDEIS MACHINERY & SUPPLY CO.
Louisville, Ky.
CAROLINA CONTR. EQUIP. & SUPPLY CO.
Columbia, S. C.
CLYDE EQUIPMENT CO.
Seattle, Wash., Portland, Ore.
THE DAY & MADDOCK CO.
Cleveland, Ohio
D. C. ELPHINSTONE, INC.
Baltimore, Md.
R. B. EVERETT & CO.
Houston, Tex.
FUNKHOUSER EQUIPMENT CO.
Kansas City, Mo.—Oklahoma City, Oklahoma
THE GALIGHER CO.
Salt Lake City, Utah
GARLINGHOUSE BROS.
Los Angeles, Calif.
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Boston—Springfield, Mass.
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HUNTER MACHINERY CO.
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R. H. HYLAND CO.
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McNIELLY MACHINERY CO.
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OLE K. OLSEN
New Orleans, La.
PENN TRACTOR & EQUIPMENT CO.
Front & Brown Sts., Philadelphia, Pa.
JOS. S. POTTS, JR. & CO.
Richmond, Va.
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H. W. SYKES
Norfolk, Va.
H. B. TREVOR CO.
Buffalo, N. Y.
TURNER SUPPLY CO.
Mobile, Ala.
WILSON-WEESNER-WILKINSON CO.
Nashville, Tenn.
YANCEY BROS.
Atlanta, Ga.
YANCEY TRACTOR CO.
Albany, Ga.

Foreign Representatives:

THE BRITISH STEEL PILING CO., LTD.
London, England

DRIVE

McKIERNAN-TERRY

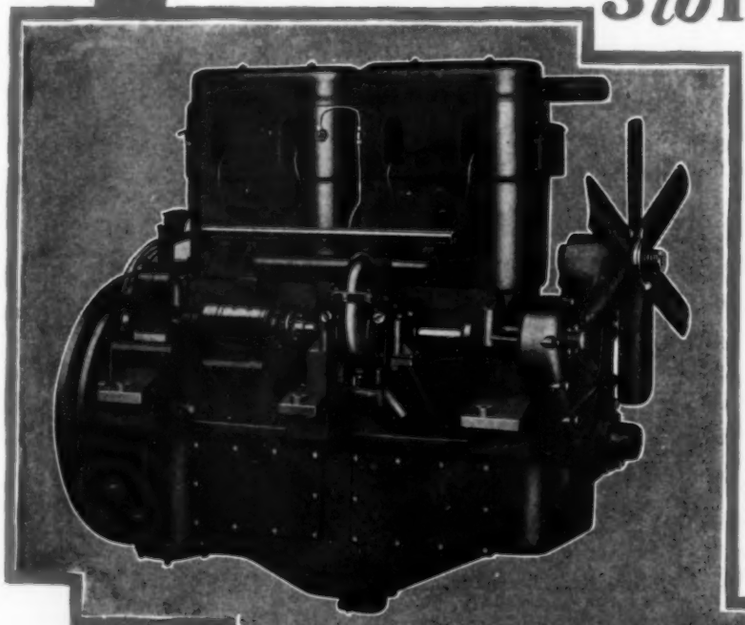
The Pioneer Double-Acting Hammers

PULL

YOUR... OPERATING COSTS ARE LOWER WITH...

LE ROI ENGINES

3 *to* 170 HORSE POWER



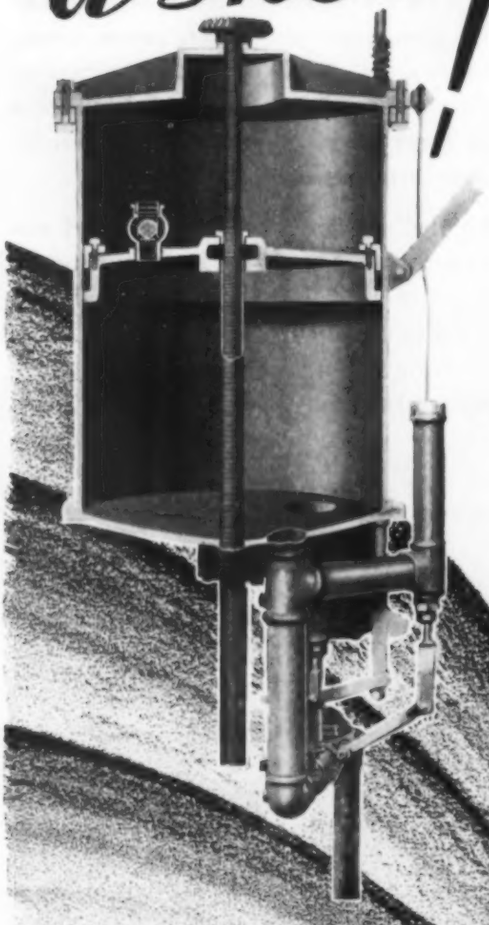
SIMPLY because the Le Roi Engine gives *dependable power, consistently* — it holds down operating costs. Those idle hours which cost so terrifically are turned into profitable production.

Le Roi's claim to this high and enviable position is an earned one. It is entirely due to unparalleled performance—lower maintenance costs — longer life — in short, the lowest operating costs per day and per year.

Le Roi's the Power!

LE ROI COMPANY · MILWAUKEE, WIS.

The New MULTIFOOTE water tank Gets the water into the drum like a shot!



WITH a touch on the Power Operator the water is in the drum in not much more time than it takes to tell it—right along with the aggregate. The water discharge line is 3½" in diameter and is free from all unnecessary right angle bends. The low pressure operation of the tank permits the use of a plain lift valve—another step toward speed and simplicity.

See this new water tank. Send for the new Foote Catalog.

THE FOOTE COMPANY, Inc.
of Nunda, N.Y.
World's largest exclusive builders of road pavers

See the 1929

MULTIFOOTE
The Paver with Timken Bearings

Frank E. Hall
152 W. 42nd St.
New York City.

MultiFoote Sales Company
2811 West Fulton St.
Chicago, Ill.

Wilcox Brothers, Inc.
588 Chenango St.
Binghamton, N. Y.

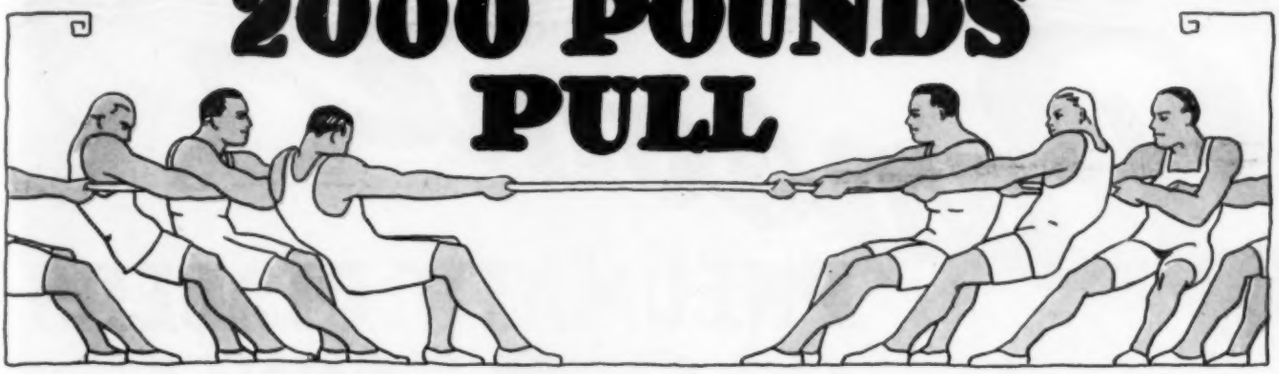
Burton Franklin
Volunteer Bldg.
Chattanooga, Tenn.

E. J. McHarg & Co.
31 Crestmont Rd.
Binghamton, N. Y.

Edward R. Bacon Company
Folsom at 17th St.
San Francisco, Calif.

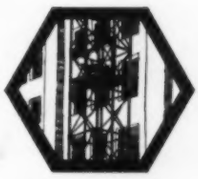
CM7-

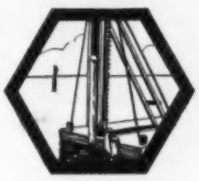
2000 POUNDS PULL



What Will It Do?

BROWN "GIANT-LINE" HOISTS, Model 20 (single drum) and 20A (double drum), equipped with 15 H.P., gasoline or electric, deliver a 2,000 pound pull on a single line at a speed of 150 feet per minute.





THIS WILL OPERATE—

Two wheelbarrow elevator with ample reserve power.

Seven cu. ft. concrete bucket on a single line, or a 14 ft. bucket on a 2 part line.

One-third yard clamshell or dipper.

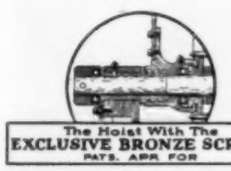
1,000 to 1,500 lb. pile driving hammer.

One-half yard scraper for excavating, back filling, leveling and drag line work.

Will pull more than two tons up a 45 degree incline on a single line, or nearly 4 tons with a two part line.

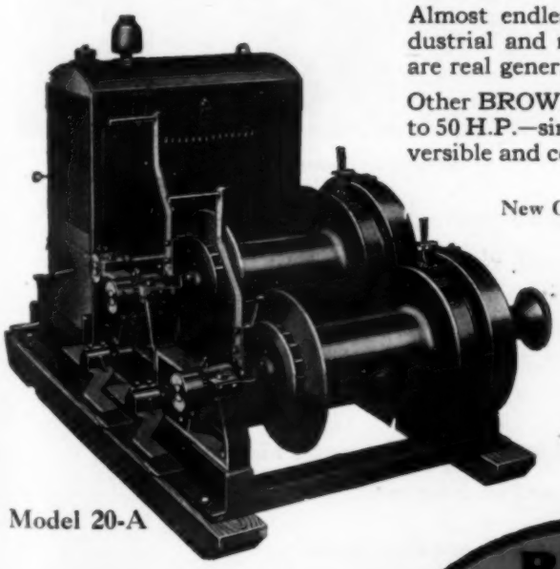
Almost endless is the variety of applications in industrial and marine work. The Models 20 and 20A are real general purpose Hoists.

Other BROWN "GIANT-LINE" HOISTS run from 4 to 50 H.P.—single and multiple drum non-reversible, reversible and conveyor types, including boom-swingers.



Unit type construction enables you to attach double drum unit to single drum Model 20 at any time.

New Catalog P, valuable Hoist Manual and new lower Price List now available.



Model 20-A

The Brown Clutch Co.

SANDUSKY, OHIO, U. S. A.

BROWN GIANT-LINE HOISTS

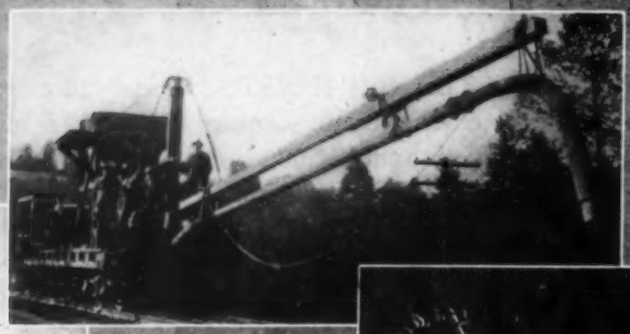
SINGLE & MULTIPLE DRUM – REVERSIBLE

NON-REVERSIBLE AND CONVEYOR TYPES

HOIST SPECIALISTS FOR 24 YEARS

Ransome

PNEUMATIC PLACERS used on the C&O TUNNEL

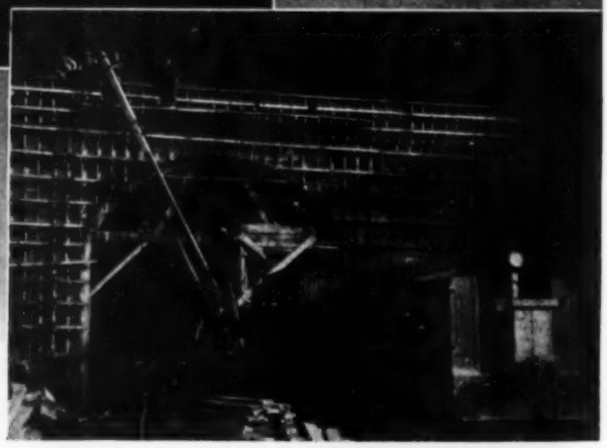


The Compressor unit, in movable form, required for Railroad use.

E. A. Rice, District Engineer, in charge of the job for the C. & O. Railroad.

Walton Construction Co., Roanoke, Va., Contractor.

Loading the Concrete.



Chuting the Concrete at the Portal.

If you have a tunnel job that calls for placing concrete under difficulties, with least interference to regular and frequent train movements, you will need a RANSOME PNEUMATIC CONCRETE PLACER.

That is what the Chesapeake and Ohio Railroad used when lining its tunnel on the main line at Covington, Virginia.

Concrete was mixed outside the tunnel, loaded into a 2-yard hopper which fed a RANSOME PNEUMATIC PLACER—all mounted on a flat car.

Ransome Bulletin 105-A tells about Ransome Pneumatic Placers.

Send for your free copy.

Ransome Concrete Machinery Company

1850—Service for 79 Years—1929

Dunellen **New Jersey**

Were your construction projects held back *by unusual weather?*

"RAINFALL *for the first five months of 1929 has exceeded the same period last year by more than 50%," reports the Chicago Tribune on the Chicago territory. In many other sections, excessive rain and bad weather generally have held back construction. A tremendous amount of work must now go forward in record time.*

Quick and Sure Delivery of Cement Is Vital to the Contractor

Atlas stands ready to answer your pressing needs no matter how large a quantity must be delivered immediately. With completion of the Waco, Texas, Plant, the combined group of Atlas mills will have a shipping capacity of twenty million barrels annually.

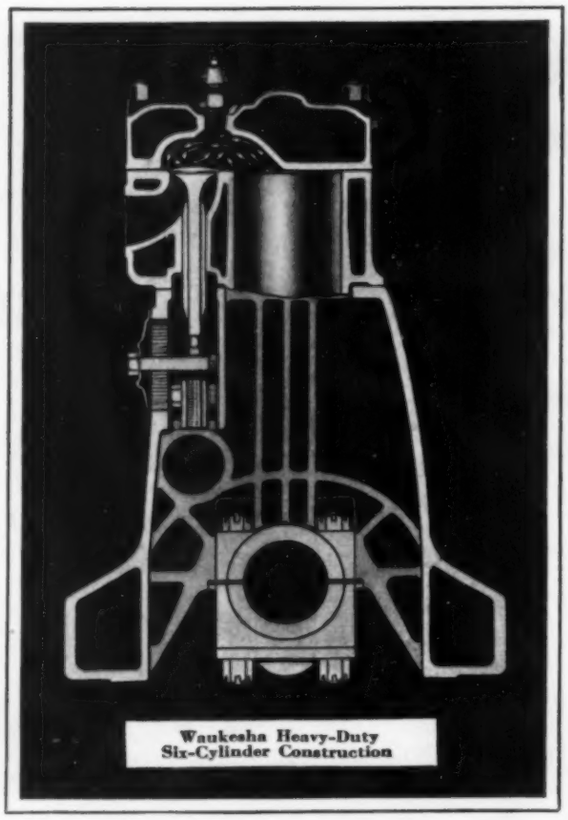
The locations of these mills enable one to supplement another when requirements demand, and their combined storage, packing and shipping facilities insure quick, dependable delivery to meet any emergency situation.

As to quality—for more than thirty-nine years Atlas has consistently exceeded every specified quality requirement.

ATLAS PORTLAND CEMENT

THE ATLAS PORTLAND CEMENT COMPANY, MAIN OFFICES: NEW YORK, ST. LOUIS

BOSTON · ALBANY · PHILADELPHIA · CHICAGO · DES MOINES
OMAHA · KANSAS CITY · OKLAHOMA CITY · WACO · BIRMINGHAM



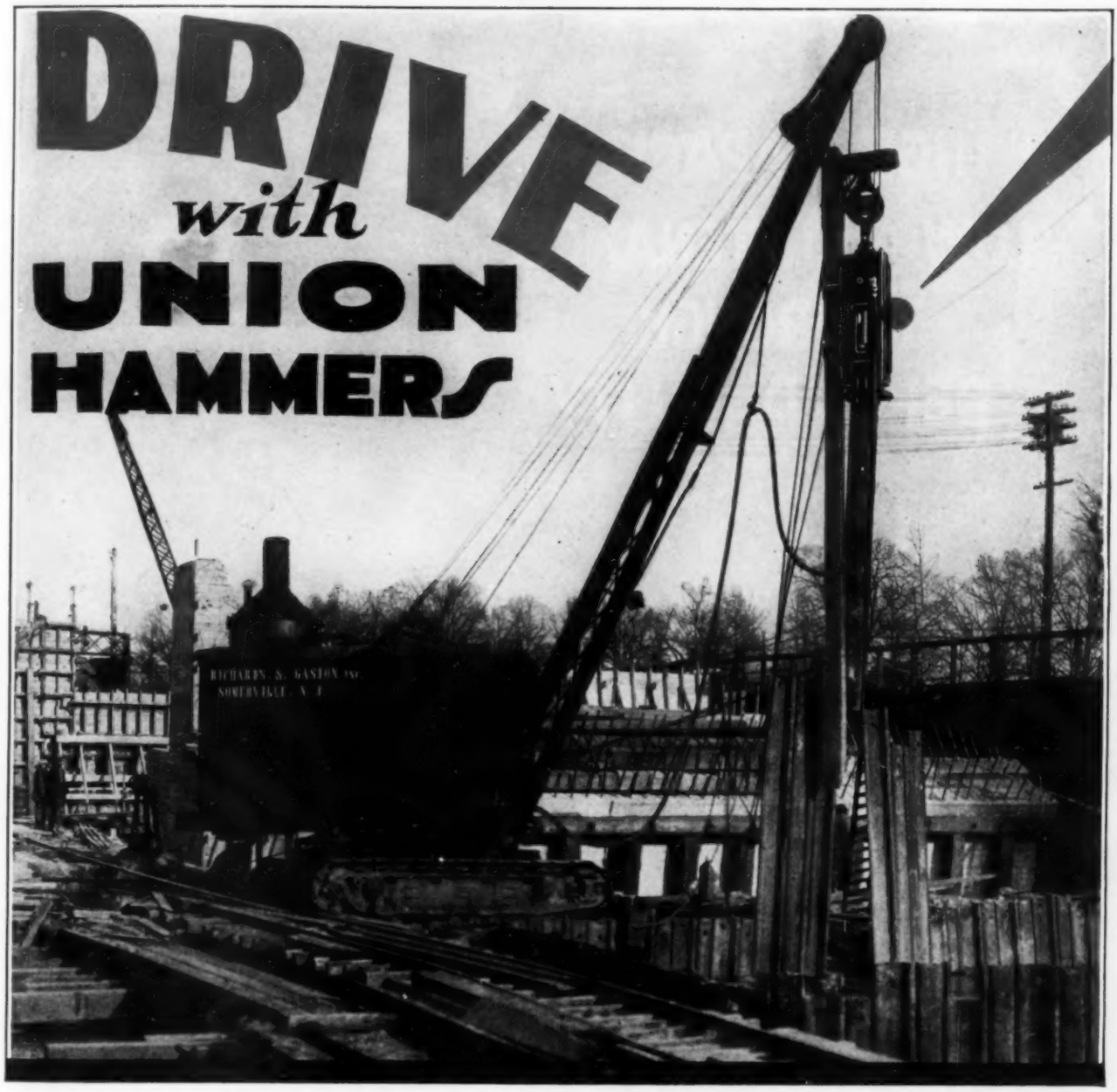
In an Emergency

. . . when reserve power is needed, Waukesha Engines never fail. There is no compromise in their design or construction . . . no limiting of power purposely, to reduce the stress in the frame.

Waukesha's "girder" type crankcase is designed for extra rigidity, both in bending and in torsion. The crankshaft is oversize—3½ inches in diameter. The steel backed bearing caps are held by four heat-treated alloy steel stud bolts. Reciprocating parts are closely paired and accurately balanced. Not only is objectional vibration thus eliminated but the combining of "girder" crankcase, rigid bearing and crankshaft construction is an exclusive Waukesha feature that makes double flywheels and dampeners unnecessary. Write for Bulletin 628. *Waukesha Motor Company, Waukesha, Wis., New York Office: 8 West 40th St., San Francisco: 7 Front St.*

954

WAUKESHA ENGINES



Here you have another contractor who knows it pays to drive with Union Hammers.

This hammer is driving steel sheeting on grade crossing elimination and track elevation work. Note the gin pole rig.

Union Hammers have a one-piece frame, enclosing and protecting all working parts.

Steam or air can be used without any change of valve or piston ring.

Made in 10 sizes to drive and pull the heaviest piles or lightest sheeting. Bases to drive any kind of piling without damage to heads.

Consult your Union Catalog for details.

Union Iron Works, Inc.

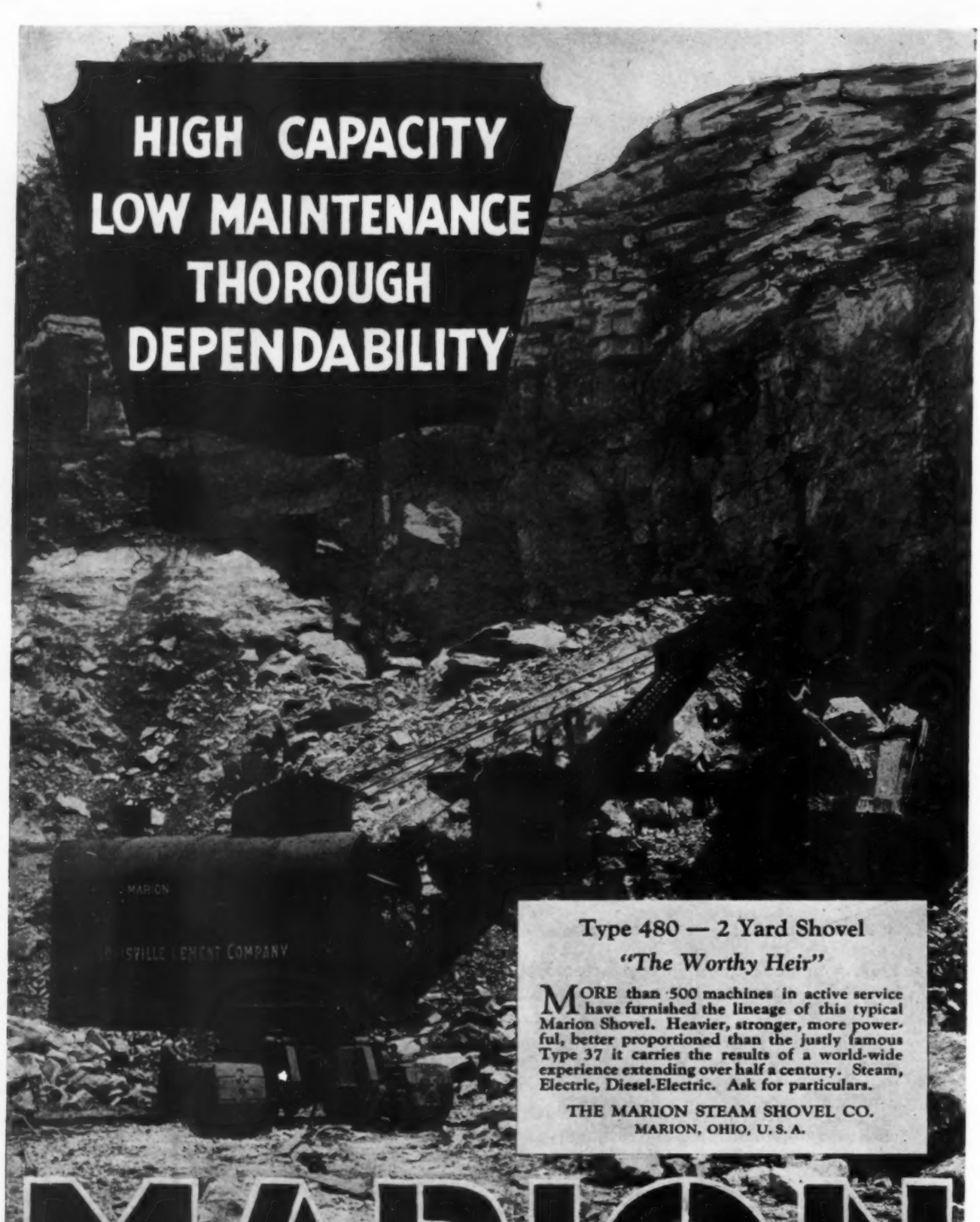
Engineers and Manufacturers

Lackawanna Siding — Hoboken, N. J.

Agents in principal cities

European Agents, Lidgerwood Limited, Friars House, London

UNION
DOUBLE-ACTING
PILE HAMMERS



Type 480 — 2 Yard Shovel

"The Worthy Heir"

MORE than 500 machines in active service have furnished the lineage of this typical Marion Shovel. Heavier, stronger, more powerful, better proportioned than the justly famous Type 37 it carries the results of a world-wide experience extending over half a century. Steam, Electric, Diesel-Electric. Ask for particulars.

THE MARION STEAM SHOVEL CO.
MARION, OHIO, U. S. A.

. . . . The "Whale" of Modern Diaphragm Pumps

For years there has been no material improvement in diaphragm pump design. Now Rex steps ahead of the field with a diaphragm pump designed to meet modern contracting conditions more efficiently. See what this new Rex gives you:

The diaphragm can be changed in 9 minutes—possible only with the modern Rex hinged pump head. It never loses its prime. The high water spout—lip above the diaphragm—assures a perfect seal of water several inches deep over the discharge valve.

The automatically lubricated engine and pump are mounted on a one-piece steel frame with all bearings integral. This means less wear—less time out for repairs.

And Rex provides, in the form of wide-faced, large diameter wheels and handy tongue, the modern means of remarkable portability.

To get complete details on what a modern Diaphragm Pump can be and do, fill in and send the coupon.

This is one of the three sizes of Rex Centrifugal Pumps that are reducing dewatering costs on large excavating jobs, cofferdam work, and other jobs handicapped by flood waters.

This is the Rex idea of a modern road and pressure pump. Automotive design throughout, vertical pump, pressure lubrication, highly portable, capable of pumping 80 gallons per minute, pressure up to 500 pounds.

CHAIN BELT COMPANY, *764 Park Street, Milwaukee, Wisconsin*

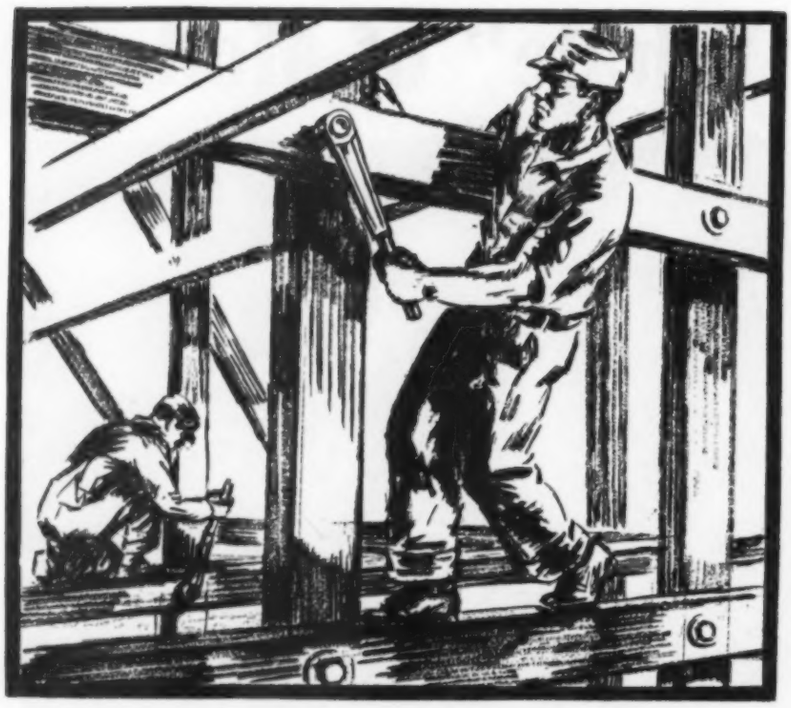
REX PUMPS

(Reg. U. S. Pat. Off.)

CHAIN BELT COMPANY
764 Park Street, Milwaukee, Wis.
Send me Catalogs on modern pump values as checked.

- ☐ Rex Diaphragm
- ☐ Rex Centrifugal
- ☐ Rex Plunger
- ☐ Rex Road

Name.....
Address.....
City..... State.....



For Tightening Lag Screws

Here's a worth-while short cut that saves time and money when working on heavy timber construction—

Lowell Lag-Screw Wrenches make quick work of nuts. One Lowell in the hand is worth a dozen open end wrenches on the job. Once fitted to a nut, the reversible ratchet feature saves all bother of refitting. Each bolt is pumped home or loosened in a fraction of the time, for pumping is a far quicker operation than refitting.

For over half a century, Lowell Reversible Ratchet Wrenches have been speeding up all jobs on which they have been used. Lag screws step lively when gripped by a genuine Lowell.

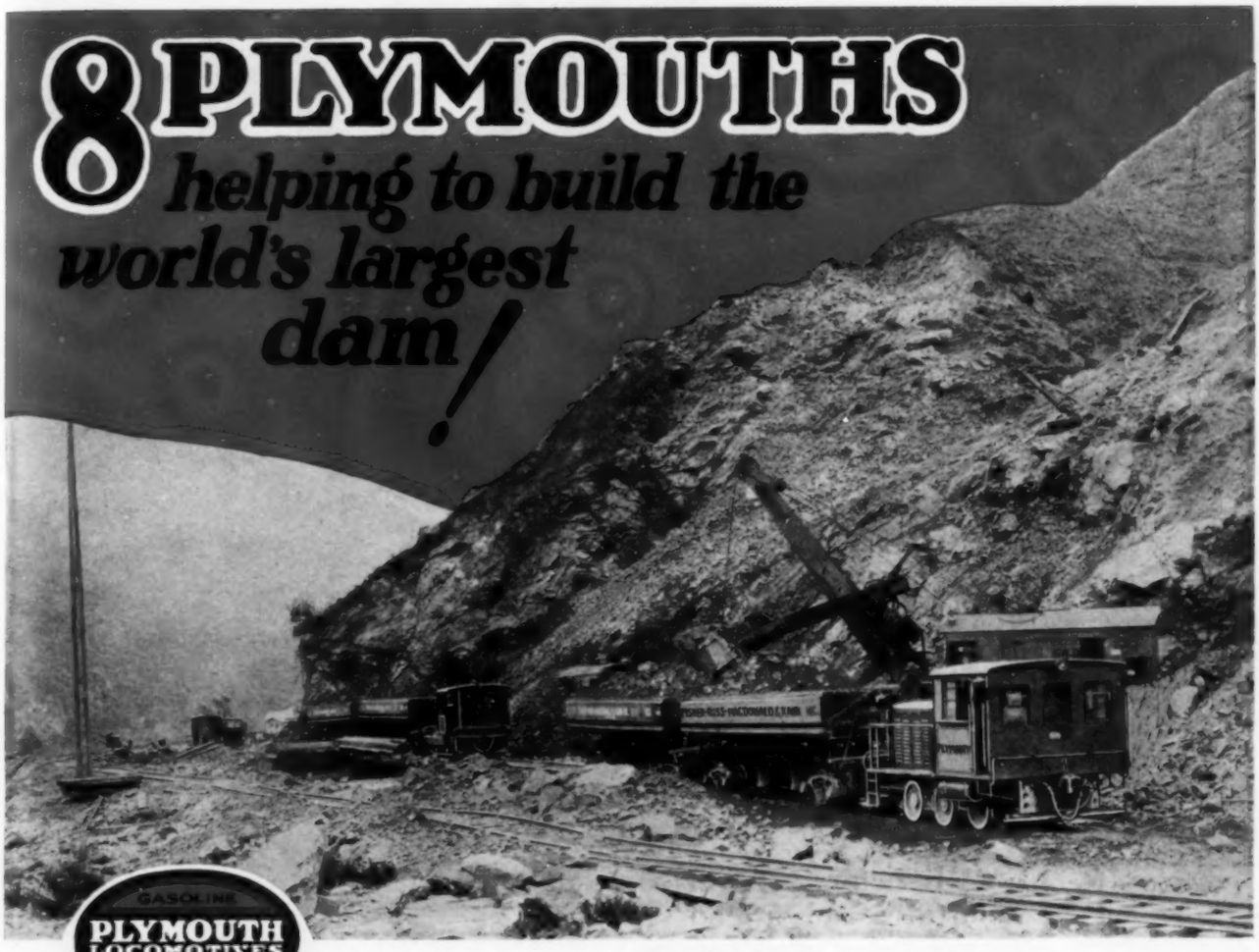
Write for complete catalog R that illustrates and describes the full line. Big special wrenches for special needs.

Lowell Wrench Company

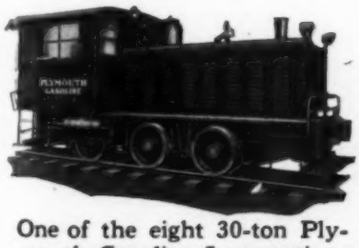
Worcester, Mass.

LOWELL
REVERSIBLE
RATCHET
WRENCHES

8 PLYMOUTHS helping to build the world's largest dam!



GASOLINE PLYMOUTH LOCOMOTIVES DIESEL



One of the eight 30-ton Plymouth Gasoline Locomotives now being used on the San Gabriel Dam.

Material handling and excavation on the San Gabriel Dam of the Los Angeles County flood control project will be a track haulage problem on a gigantic scale. As usual, Plymouth Gasoline Locomotives are in prominence.

1,250,000 yards of excavation, 4,000,000 yards of concrete, 3,500,000 pounds of steel, these and many other items that will have to be handled on the job mean a track haulage problem of unusual proportions.

To assure uninterrupted delivery of materials for a fixed working schedule, the contractors, Fisher, Ross, MacDonald & Kahn, Inc. selected 30-ton Plymouth Gasoline Locomotives. Eight of these 30-ton Plymouths are on the job. Five years from now they will be helping to put the finishing touches on the world's largest dam.

When your job demands reliability of the highest type, call in a Plymouth representative. No obligation, of course.

PLYMOUTH LOCOMOTIVE WORKS
The Fate-Root-Heath Company
299 RIGGS AVENUE, PLYMOUTH, OHIO, U. S. A.

PLYMOUTH
Gasoline and Diesel Locomotives

NEVER before a paver so fundamentally "advanced" in basic principles of construction!

In all the years of Koehring paver leadership, this is the paver that has been gradually developed to be the GREATER Koehring!

It is the top achievement of the long Koehring experience — the advanced standard of Koehring Heavy Duty construction — of money-making speed of quality concrete production — of long distance reliability and dependability.

With or without full Autocycle operation it is a new standard of automatic speed in taking materials into the charging skip and placing quality concrete on the subgrade!

So many features of high speed automatic operation — of basic advanced construction — that to describe only a few is to do an injustice to you, and to the machine.

Know all about the Greater Koehring — send for special 27E literature.

SIZES

Pavers — 27-E six cylinder Waukesha engine, automatic operations. 13-E four cylinder Waukesha engine. Comply with A. G. C. standards.

Subgrade Planers — Built for all types of roadway, 8' to 27' widths; attachable to 27-E Paver.

Construction Mixers — 14-S, 21-S, 28-S. Trucks or skids; rubber tires optional. 28-S skids only. Weigh Mix attachments on 14-S. Comply with A. G. C. standards.

Dandie Mixers — 5-S, 7-S, 10-S. 5-S single or four cylinder, 7-S two or four cylinder, 10-S four cylinder gasoline engine. Charging skip or low charging hopper and platform. Rubber tired or steel rimmed wheels. Comply with A. G. C. standards.

Division of National Equipment Corporation

KOEHRING COMPANY MILWAUKEE, WISCONSIN

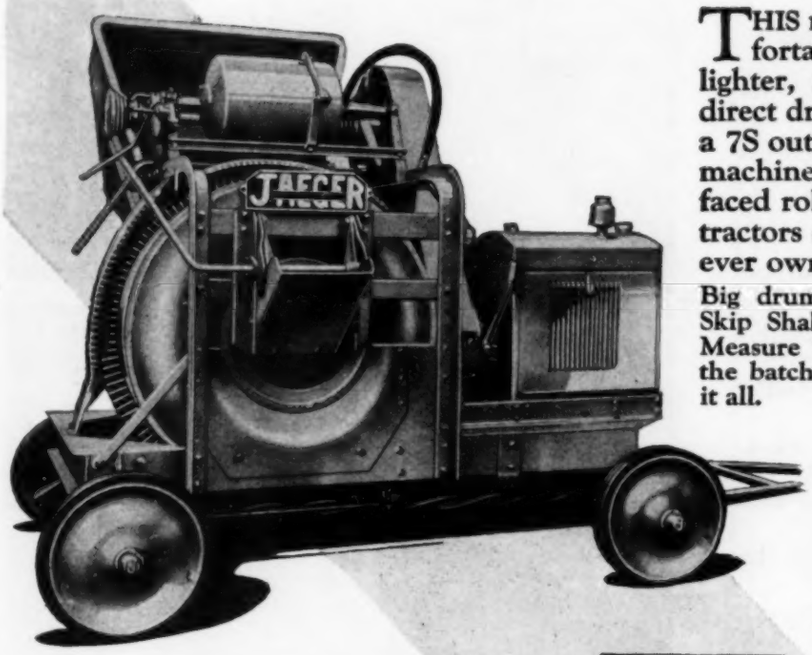
PAVERS, MIXERS—GASOLINE SHOVELS, PULL SHOVELS, CRANES AND DRAGLINES

Sales Offices and Service Warehouses in all principal cities

Foreign Department, Room 579, 50 Church Street, New York City

A-5195-1

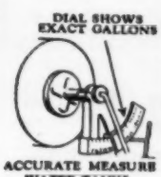
Jaeger 10S Holds 2 Bags ...Fast, Portable as a 7S!



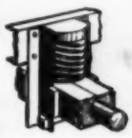
THIS mixer handles 2 full bags comfortably, yet it's all-steel (½ ton lighter, 50% stronger), short coupled, direct driven, handles easier than many a 7S outfit. Built for heavy duty, with machined steel tracks, chilled ground faced rollers, 100% ball bearings...contractors say it's the fastest mixer they've ever owned.

Big drum openings, Automatic Skip Shaker and fast Accurate Measure Water Tank speed up the batches. One man controls it all.

Automatic Skip Shaker
Shakes Loader Clean
No Pounding or Banging Out of Shape



ACCURATE MEASURE WATER TANKS



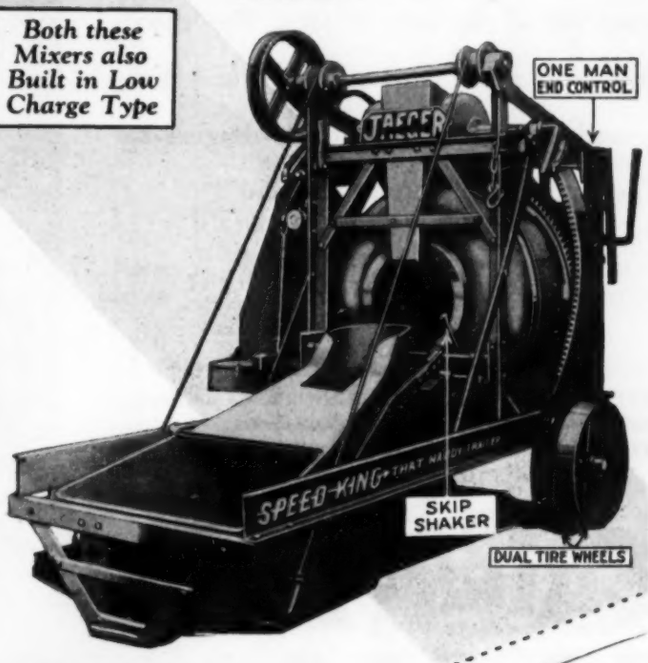
SPRINGS

SPEED KING...
End Discharge...Fastest Handiest One Bag Mixer that Money Can Buy!

Both these Mixers also Built in Low Charge Type

WHEN this outfit outsells all other one-bag mixers...there's a reason. You can make more money with it. Takes about 6 ft. of street room, charges in 7 seconds, discharges 7 to 10 seconds. A real trailer, it rides on dual tires, springs, roller bearings. Has all advantages of the side discharge and can also be used as a paver. Paves sidewalks, alleys, etc., pours into forms. Has niggerhead for snubbing.

Jaeger all-steel construction gives 50% added strength, saves ½ ton weight. Patented features, Skip Shaker, Accurate Measure Tank, etc. are standard equipment.



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800 Dublin Avenue, COLUMBUS, OHIO

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Please send catalog, prices, terms on ... ☐ **Non-Tilt Mixers** ☐ **Tilting Mixers** ☐ **Plaster Mixers**

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The trucks went to the road's end—then the "Caterpillars" took up the job. Up a stiff grade, over no road at all—that's the place where the "Caterpillar" track-type tractor proves its metal! Armed with "Caterpillar" power the man out on the lease finds many ingenious ways to cut costs on all manner of jobs. For those wide tracks lick sand and mud and dust —and there's a dependable engine to "pull anything loose at one end"!

Prices—f. o. b. Peoria, Illinois

TEN	$1125	TWENTY	$1975
FIFTEEN	$1500	THIRTY	$2475
	SIXTY	$4300	

Caterpillar Tractor Co.
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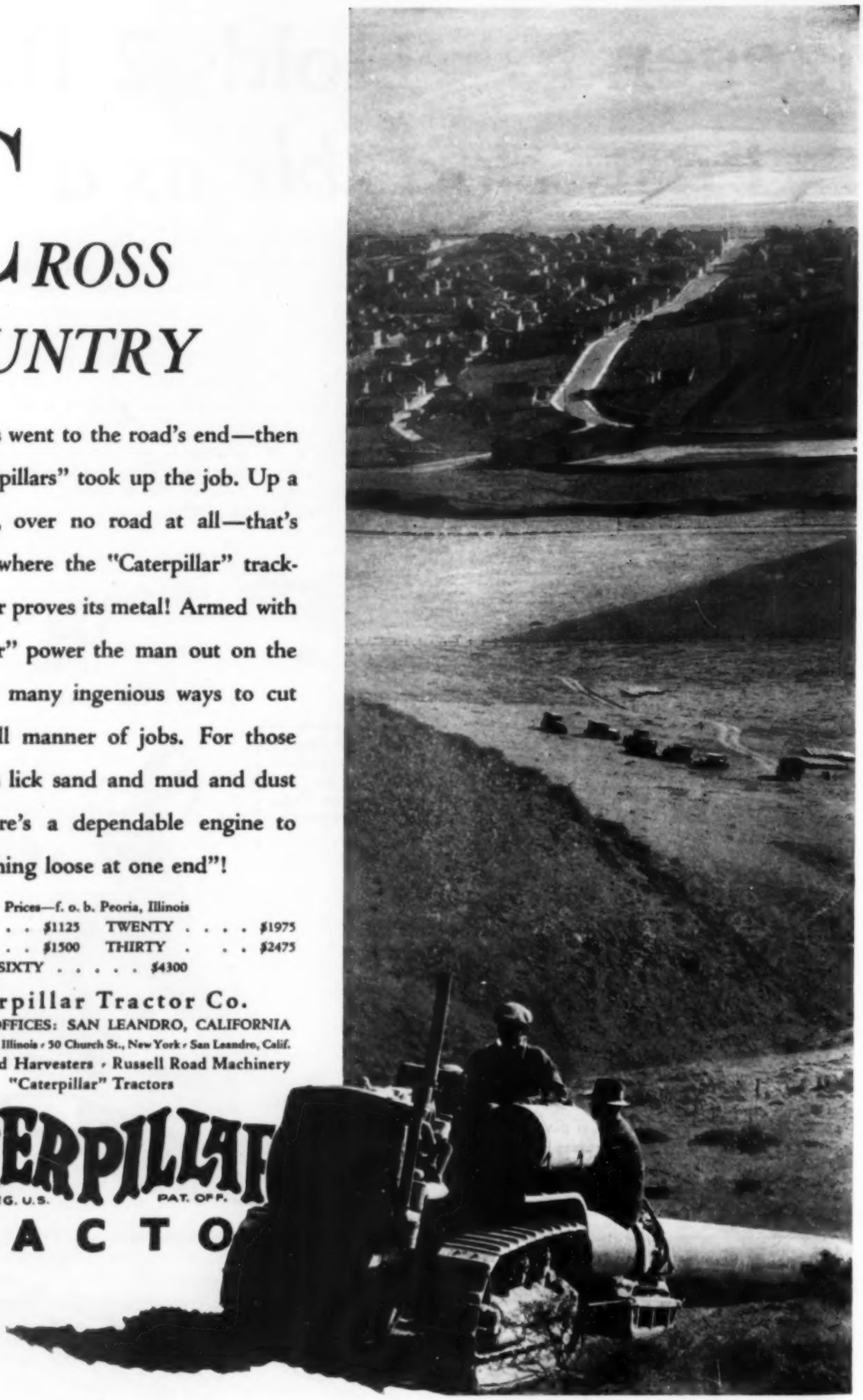

Ten Reasons for the Record-Breaking Popularity of the Six-Cylinder CHEVROLET TRUCKS

for Economical Transportation

CHEVROLET

In every section of the country, the new Chevrolet Six-Cylinder Trucks are sweeping ahead to one of the greatest records of success in the history of the commercial car industry—

—for these sensational new trucks meet, with unusual efficiency, the problems presented by crowded traffic conditions and modern ideas of prompt customer service.

They provide the remarkable flexibility, acceleration, speed and reserve power of the six-cylinder engine—with body types specifically designed for every business need. They afford outstanding economy of operation—and are actually available *in the price range of the four!*

Read, in the column at the right, the ten big reasons why truck users everywhere are turning to Chevrolet. Then get in touch with your Chevrolet dealer—and arrange for a trial load demonstration!

CHEVROLET MOTOR COMPANY, DETROIT, MICH.
Division of General Motors Corporation

The Sedan Delivery .. $595 The Light Delivery Chassis $400 The 1½ Ton Chassis .... $545 1½ Ton Chassis with Cab .. $650

All prices f. o. b. factory, Flint, Michigan

A SIX IN THE PRICE RANGE OF THE FOUR

1 Six-Cylinder Power—that carries full capacity loads up the steepest hills with abundant reserve power—plus the adaptability of a four-speed transmission, with power take-off opening on the 1½ ton truck.

2 Six-Cylinder Speed and Acceleration—that permit the servicing of wider areas, and the completion of more trips—whether in city service or suburban usage.

3 Six-Cylinder Smoothness—that protects the entire truck from the destructive effects of undue vibration and affords exceptional comfort to the driver even on the longest trips.

4 Remarkable Handling Ease—that results from a full ball bearing steering mechanism; big, non-locking four-wheel brakes; and a remarkably smooth transmission.

5 Amazing Economy of Gasoline and Oil—due to such advanced engineering features as hot-spot manifold, automatic acceleration pump and crankcase breathing system.

6 Outstanding Dependability—achieved by thoroughly tested construction in every unit—from the rugged rear axle to the large-capacity, highly efficient Harrison radiator.

7 Extremely Economical Service—provided by 10,000 Authorized Chevrolet Service Stations, operating under a low flat-rate system of charges.

8 Ample Capacity—made possible by a heavy channel steel frame, with sufficient frame length to permit the mounting of unusually large bodies without extensions.

9 Wide Selection of Body Types—that make Chevrolet Trucks adaptable to every line of business. And among them is one designed especially for your requirements.

10 Amazing Low Prices—that make Chevrolet Trucks the biggest values ever offered—combined with the lowest available financing charges for those who desire to buy on easy terms.

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1st Superintendent: "We're in a jam all right — late getting started and bad luck on the whole building. Here we've barely started on this garage floor and it's got to be ready in less than a week. What'll we do, John?"

2nd Superintendent: "Don't worry. We can make 3-day concrete with the Universal cement that's right here on the job. I know how to mix it. I put in two jobs with it back in Pennsylvania last year and they turned out fine."

To *Every* Construction Man:

Knowing the methods for making *High-Early-Strength Universal* Concrete with the same Universal cement that is used for regular work comes in handy on any rush job. Full description of these methods will be furnished on request. No obligation. Just mail the coupon.

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Publishing Director

Volume 11 | New York, July, 1929 | Number 7

"Thar She Blows!"

HAMMERS *(above)* sink open-end piles which are blown out *(left)* with compressed air prior to being filled with concrete.

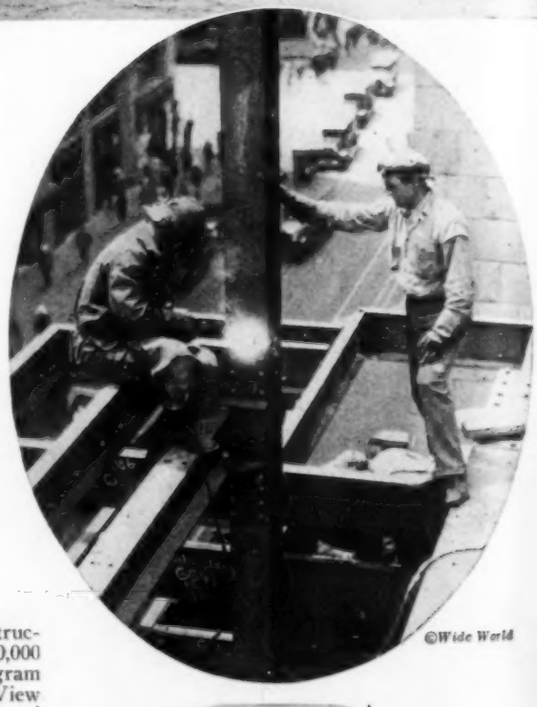
IN SINKING 15-in. open-end piles Spencer, White & Prentis, of New York, follow the practice illustrated herewith. Driving is done with McKiernan-Terry air hammers at 100-lb. pressure. After sinking 20 ft., an air jet line is used to blow out the spoil inside the cylinder, a new length of pipe is coupled on, and sinking continues to a depth of 80 ft. or more. The tube, after reaching grade, is filled with concrete.

This Month's

©P. & A.

TALLEST OFFICE BUILDING in the Northwest. Foshay Tower, Minneapolis, 87 x 89 ft. in plan at base, extends 33 stories to height of 450 ft. from street level. The general contractors for the structure were Maurice Schumacher and the National Contracting Co., of Minneapolis. Steel erection was by Oscar Daniels Co., Chicago and Minneapolis Steel & Machinery Co.

DETROIT-CANADA TUNNEL *(above)* showing concreting plant for anchored tubes which are built on shore, floated to place and sunk. Parsons, Klapp, Brinckerhoff & Douglas, New York, are engineers for the project.



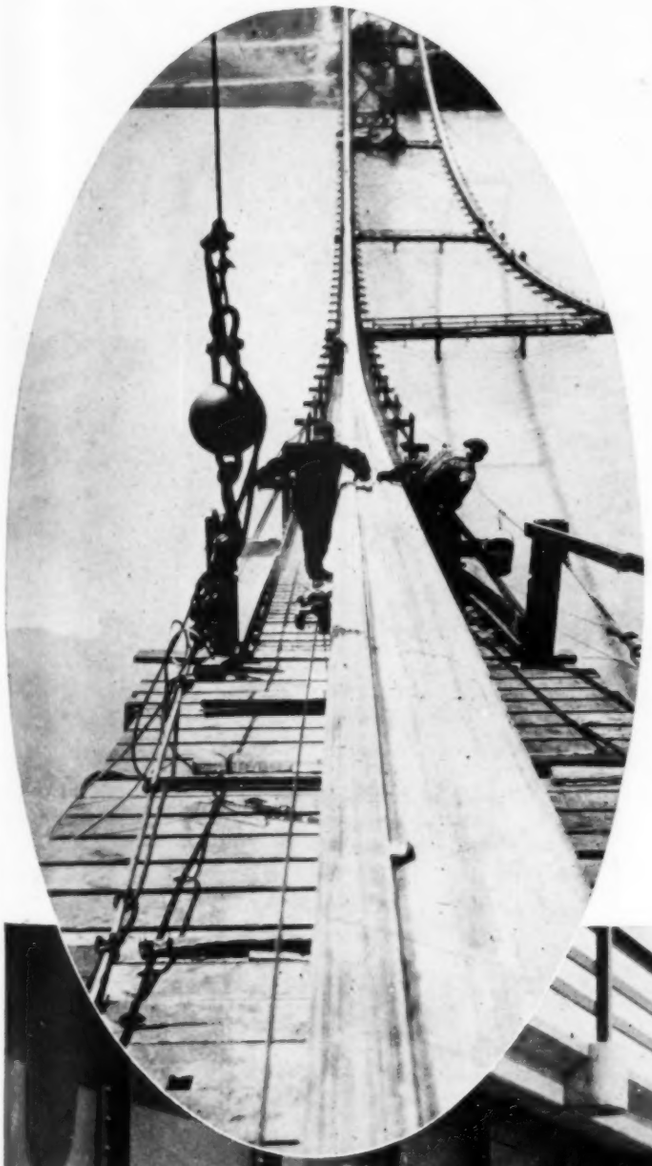
©Wide World

STRUCTURAL WELDING *(right)* in its first application to building construction in Los Angeles. The job is an addition to the Pacific Mutual Building by the Consolidated Steel Corp.

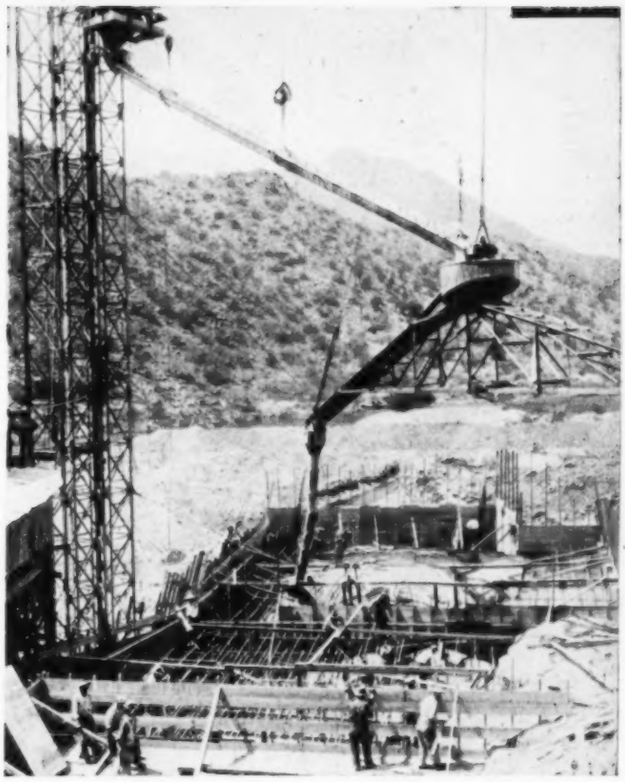
MODELS *(below)* of structures included in $50,000,000 Government building program in Washington, D. C. View shows how new Department of Commerce building will look when completed.

©Henry Miller

"News Reel"

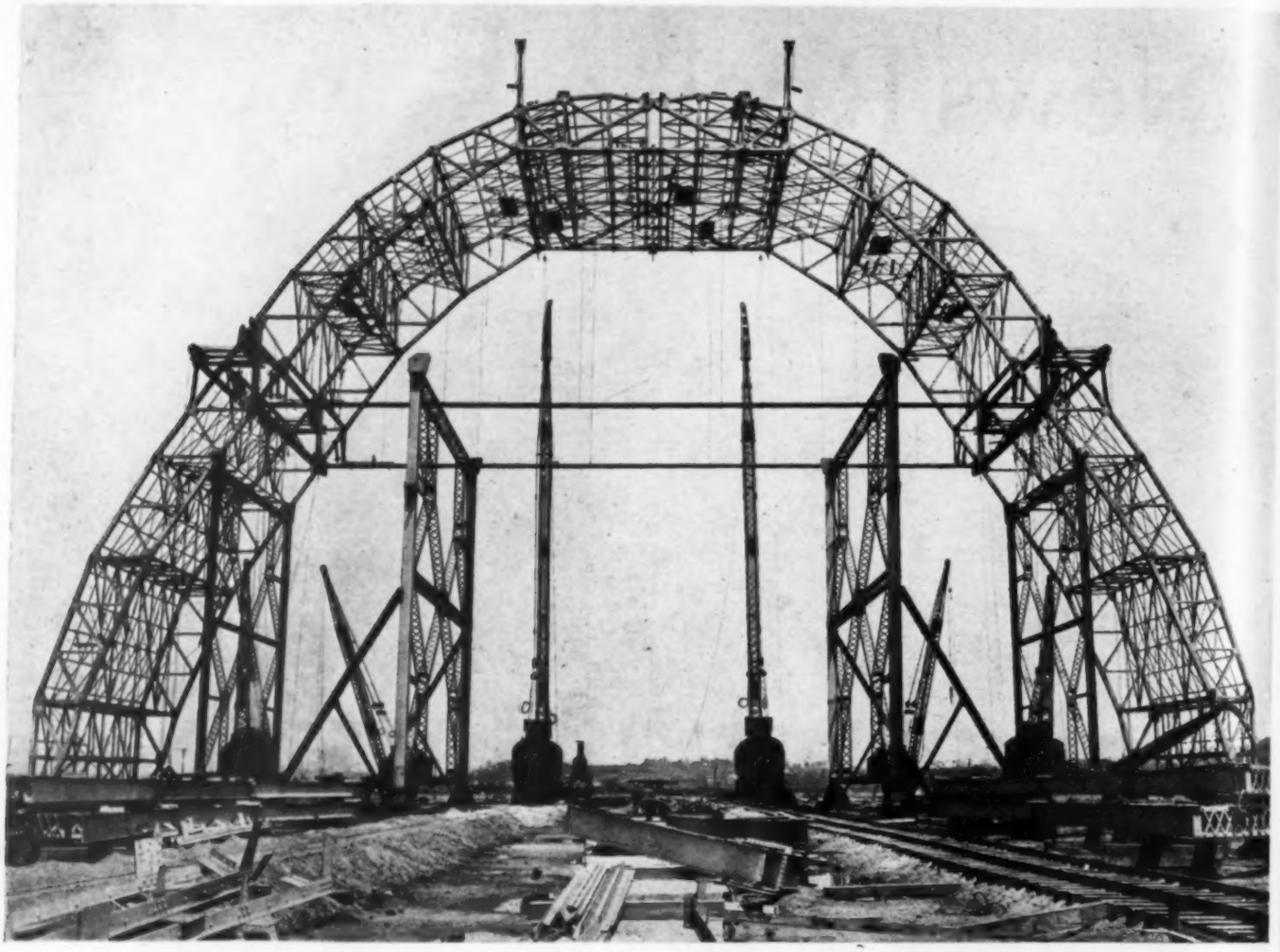


DISMANTLING CABLES *(left)* of Ambassador suspension bridge, Detroit, became necessary after breakages in heat-treated wire strands had occurred.



POURING FIRST CONCRETE for Stewart Mountain dam, 180-ft. arch type structure in Arizona being built for and by Salt River Valley Water Users Association, C. C. Cragin, chief engineer.

ACROSS SANDUSKY BAY *(below)* in Ohio nineteen 100-ft. plate girder spans and one 65-ft. lift span provide new traffic route.



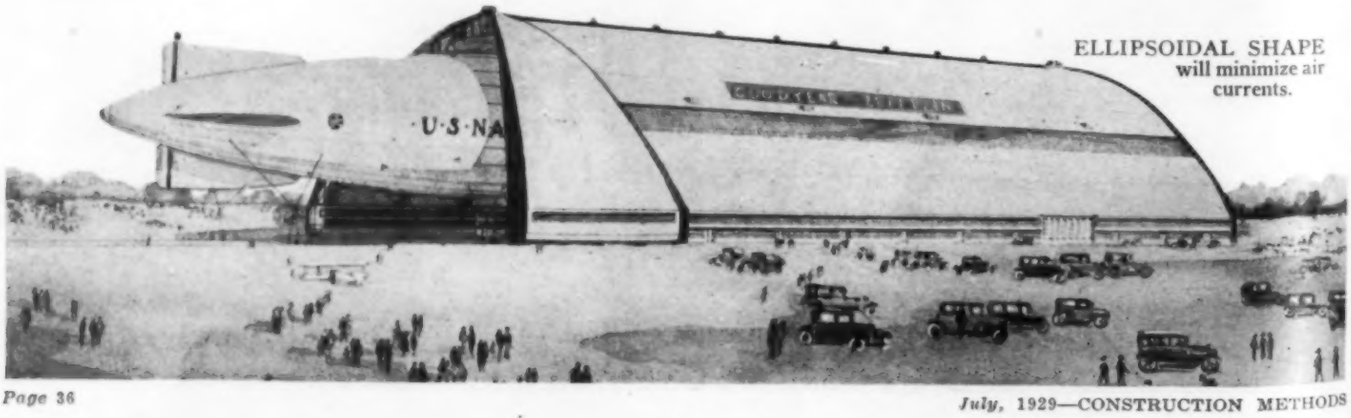
FIRST ARCH of airship factory and dock erected; there will be 13 spans of similar size in the huge structure.

UNIQUE ERECTION METHODS

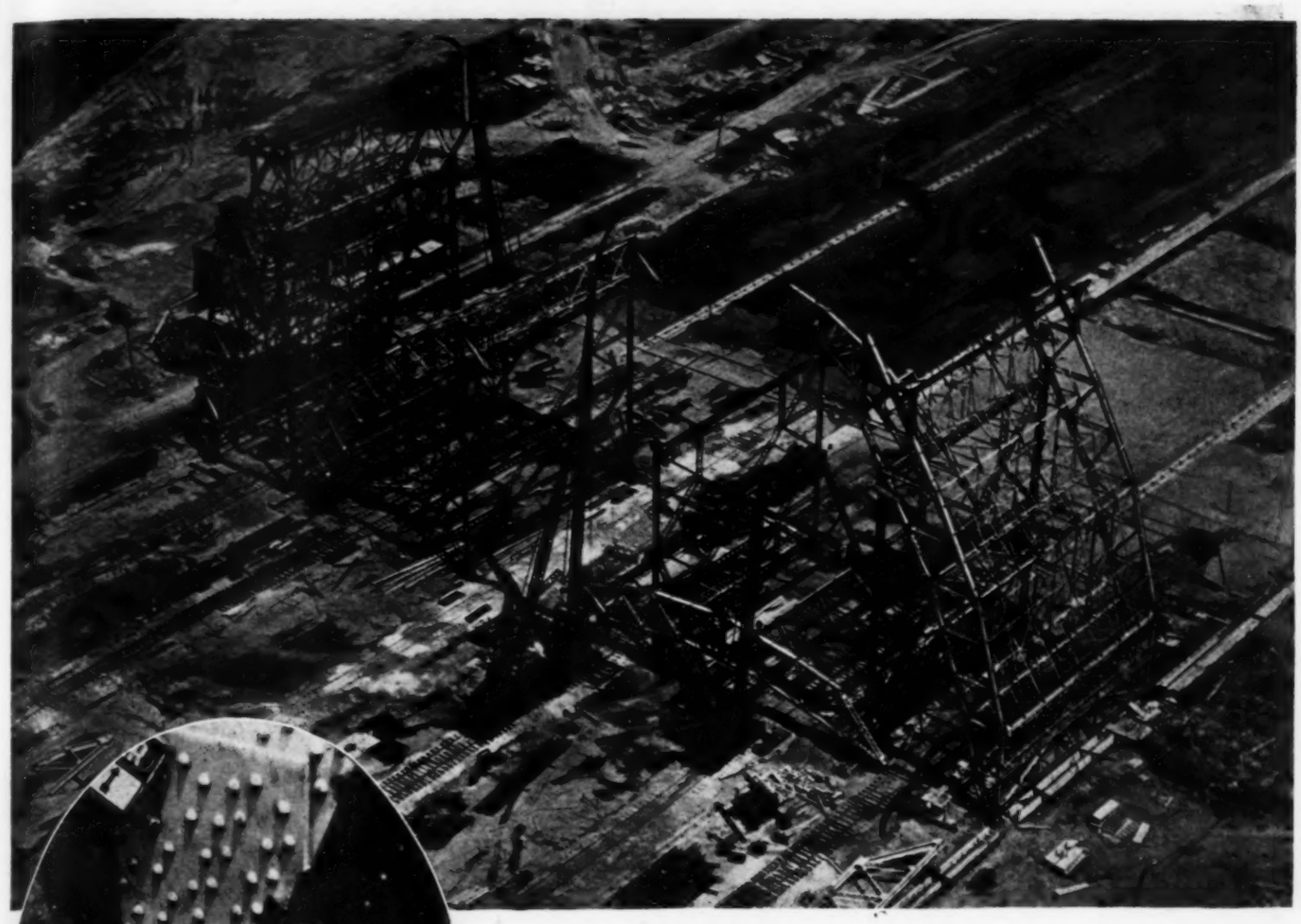
Feature Building of Giant Airship Dock and Factory

PROBLEMS incident to the erection of three-hinged steel arch trusses with a span of 325 ft., c. to c. of pins, and a pin-to-pin height of 197 ft. 6 in. induced the American Bridge Co., contractor for the steelwork on the Goodyear-Zeppelin Corporation's new airship factory and dock at the Akron, Ohio, municipal airport, to adopt novel methods for this part of the construction. Thirteen similar trusses, approaching a semi-ellipse in top-chord outline and approximately 16 ft. deep between chords at all points, constitute the frame of the building. Trusses are three-hinged for erection purposes only. Once the center pin is driven the trusses are converted into two-hinged arches by making the bottom chord continuous.

Design Features—The airship factory and dock is designed for the construction of rigid-frame, multi-cellular lighter-than-air craft, larger than any now contemplated. Two ships of 6,500,000-cu.ft. gas volume already are under contract for delivery to the



ELLIPSOIDAL SHAPE will minimize air currents.



CENTER SECTION of truss is erected on ground and later raised to place between haunch sections by special crane and counterweight rig. *(In oval)* PIN CONNECTION at fixed base of arch

U. S. Navy; these are 785 ft. long and 132.9 ft. through at the section of maximum diameter. To house ships of this and much larger size the building is 1,184 ft. 4½ in. long. Twelve bays between arch trusses, ten of 80 ft. and two of 83 ft., make up 966 ft. of this distance. Curved doors in the form of a quadrant of a sphere add 109 ft. 2¼ in. to the length at each end. The doors revolve about a pin connection at the top and move on a circular railroad track of 187-ft. radius.

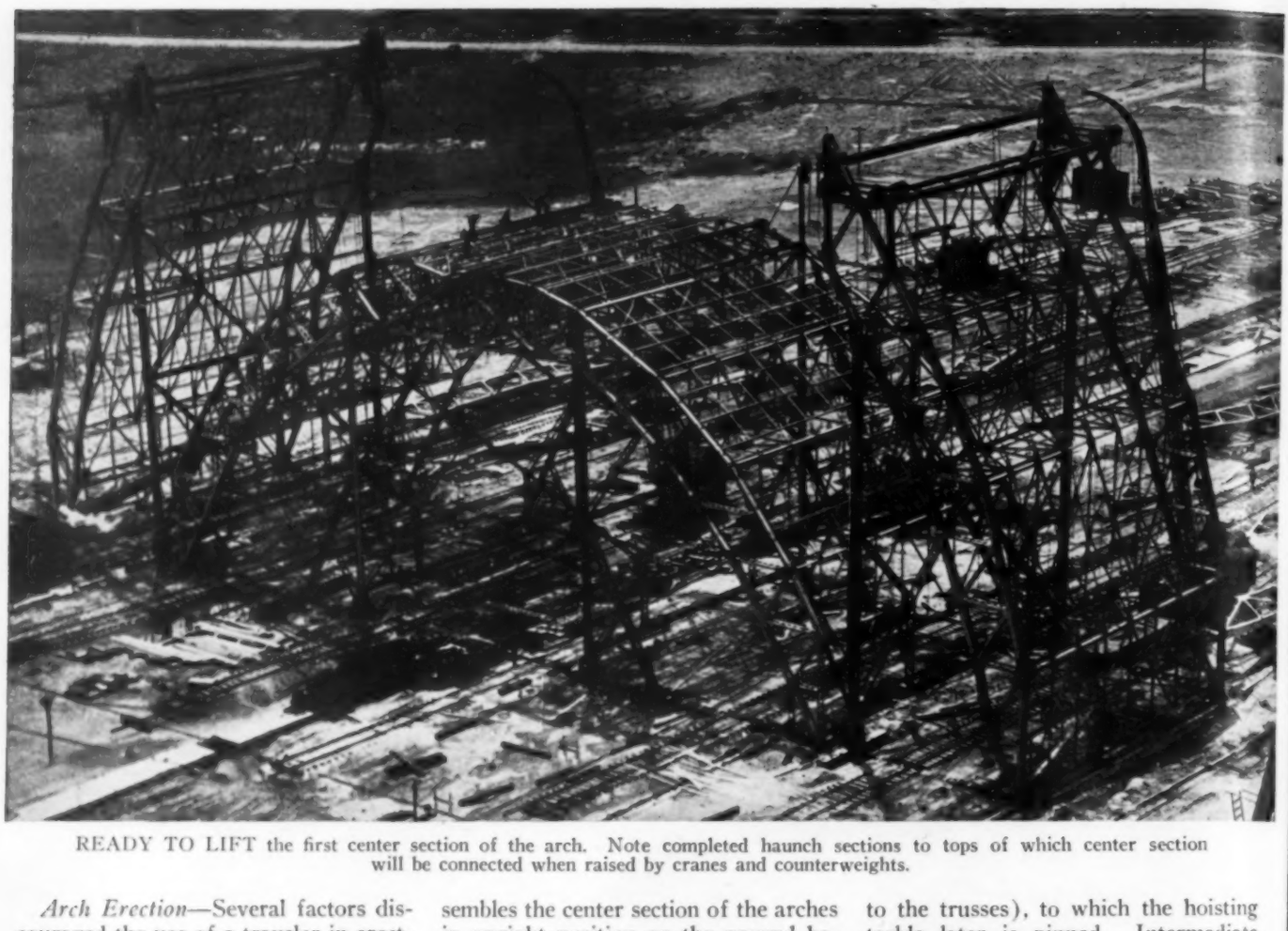
The new dock differs radically from its predecessors in this country in the shape of both cross-sections and doors. Vertical walls and ends and pitched roofs have been the common features of previous designs. The sides of the new building are vertical to a height of only 27 ft., where they break into the first of the sloping chords of the arch. The semi-ellipsoidal shape of the entire shell to be covered with Robertson asbestos-protected metal sheets, is intended to prevent formation of air currents which add to the difficulties of launching and docking an airship.

The arches bear on concrete pedestal footings 6 ft. deep, with a bottom area 15 ft. 6 in. square and a top area 8 ft. 6 in. on a side. Each footing rests on 25 MacArthur cast-in-place concrete piles driven an average distance of 25 ft. to solid rock, with the inside and outside rows battered. The two footings carrying a truss are connected by a reinforced concrete tie beam 4x5 ft. in cross-section.

A railroad passes close to the 60-acre tract purchased by the Goodyear-Zeppelin Corporation at the airport. Two 1,200-ft. spur tracks were laid to serve the steel yard. The American Bridge Co. placed six tracks within the area of the airship dock to facilitate erection with locomotive cranes.

Erection Procedure—The construction scheme calls for erection of arches in pairs. Longitudinal expansion and contraction of the steel were provided for by placing the five arches nearest each end on rockers. Only the three middle trusses, 6, 7 and 8, are fixed at the base. In order to have a fixed arch from which to work the contractor preferred to start erection at the center. Following this plan, the erection crew completed arches 6 and 7 first and worked from these two toward the south end, starting next on arches 4 and 5.

The builders intend to finish one end of the airship factory as rapidly as possible in order that Goodyear may begin construction of a new ship in this portion while the other end is being erected. Building operations, such as covering the steel frame with corrugated protected metal roofing and laying the concrete floor, are scheduled to follow the steel erection closely. All classes of work on the first half of the factory thus will be completed about the same time.



READY TO LIFT the first center section of the arch. Note completed haunch sections to tops of which center section will be connected when raised by cranes and counterweights.

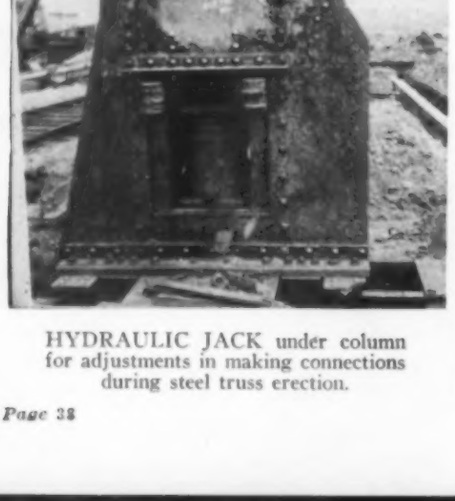
Arch Erection—Several factors discouraged the use of a traveler in erecting the arches. Size, weight and cost were important; but also to be considered was the delay and expense of dismantling and reassembling the upper portion of the traveler when moving it back to erect the second half of the airship factory and dock. A much simpler and less expensive method was devised:

By the scheme adopted the contractor erects the haunch sections of two arch trusses to a height within the reach of long-boom cranes and assembles the center section of the arches in upright position on the ground between the haunches. The center section then is lifted to place by means of two sets of tackle at each corner, one set being tied to counterweights and the other being operated by the drum of a crane. The fixed sheaves of both sets are supported on the haunch section directly over the falsework bent.

In erecting the haunch sections a truss is assembled on the ground, is pinned at the shoe, and is lifted into a stirrup on the falsework column, to which it is bolted. After the two haunch trusses have been set, cranes place the intermediate vertical and horizontal trusses, rafters, and purlins and erect posts, brackets, cross-beams, sheaves and blocks for the lifting operation on the trusses over the falsework columns.

Erection of Center-Section—Two steel bents support the halves of the center section during erection. The major portion of each half is assembled on the ground and is placed in position on a falsework column by a locomotive crane. A tie-beam on the ground connects the extremities of each truss, preventing movement during erection of the top members and distortion during the lifting operation. The ends of the tie-beams rest on longitudinal lifting beams (at right angles to the trusses), to which the hoisting tackle later is pinned. Intermediate trusses and members then are placed by cranes. After the top members have been erected and the center pin driven the hinged trusses are converted into a rigid, continuous truss by splicing the bottom chords to a connecting horizontal beam.

A 100-ton hydraulic jack with a 9-in. runout inserted in each of the tie beams on the ground and a similar jack under each of the four columns provide for any adjustments necessary in making connections. After



HYDRAULIC JACK under column for adjustments in making connections during steel truss erection.

COUNTERWEIGHTS were steel plate boxes filled with punchings—weight, 36 tons.

erection has been completed the falsework bents are taken out and moved ahead to their next position. Vertical ties are installed between the lower chords of the arches and the horizontal beams on the ground to support the beams when they are lifted clear. With counterweight and hoisting lines pinned to the lifting beams the center unit is ready to be raised.

Two 36-ton counterweights, consisting of riveted steel plate boxes filled with punchings, are used at each corner of the center unit. In placing a counterweight ready for the lifting operation a bight of cable of the proper length, with both ends tied to the box, is laid across two pairs of sheaves on the falsework overhead and the bight then is pulled down and pinned around a sheave on the lifting beam, the counterweight being raised the required distance in the process. The hoisting fall at each corner of the center unit is reeved from the drum of a crane through a lead block hitched to the base of the falsework column and through blocks shackled to the end of the lifting beam and to the end of a longitudinal beam placed on the falsework above. Counterweights balance 80 per cent of the load; the cranes hoist the remaining 20 per cent. Under each column of these falsework bents is placed a 300-ton hydraulic jack with a 9-in. runout to take care of adjustments in connecting the center unit to the haunch sections.

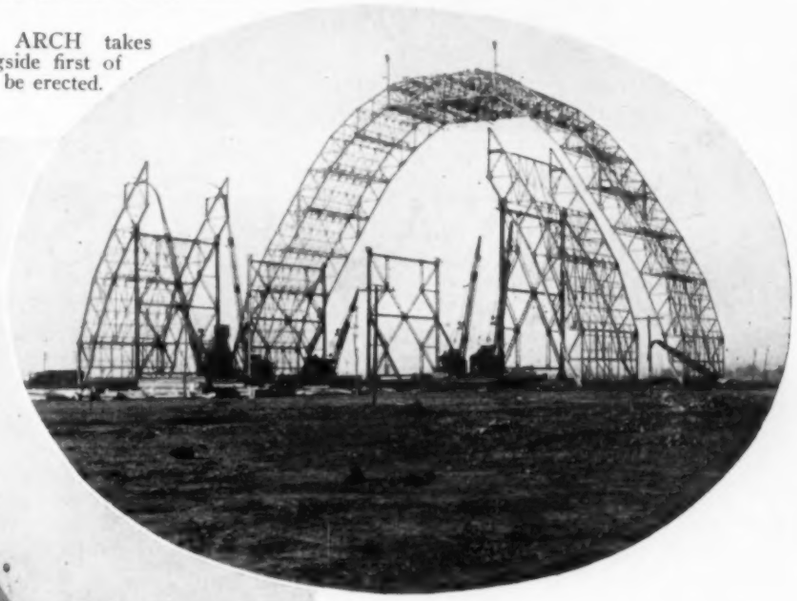
During raising the center section of the arch truss is kept level with the aid of weighted piano wires and graduated boards, serving as height gages at each end of the center unit.

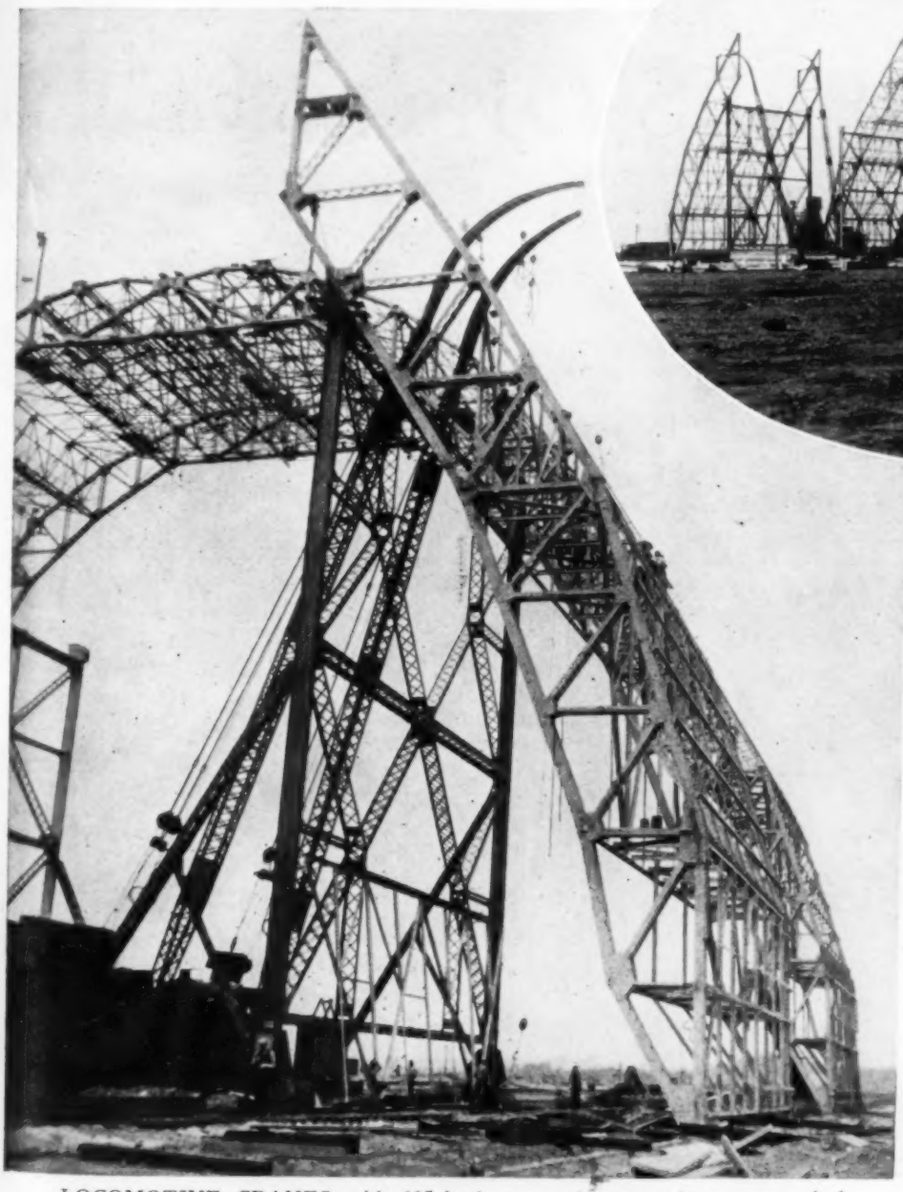
The height of the bents supporting the haunch sections is approximately 92 ft. from base plate to bottom chord of the truss. Bents supporting the center section are about 75 ft. high, and the horizontal beams connecting the extremities of the center unit are approximately 216 ft. long. All bays of the airship dock are 80 ft., except the two end bays, which are 83 ft.

The American Bridge Co., on the erection work, is using seven Industrial-Brownhoist locomotive cranes. Five, of 50-ton capacity, have 50-ft. booms, while two 60-ton cranes are equipped with 105-ft. booms and goosenecks which give them a total vertical reach of about 145 ft.

Shop work on the steel has been extremely accurate. It was unnecessary to burn a hole in driving 14,000 rivets for the erection of the first pair of arches.

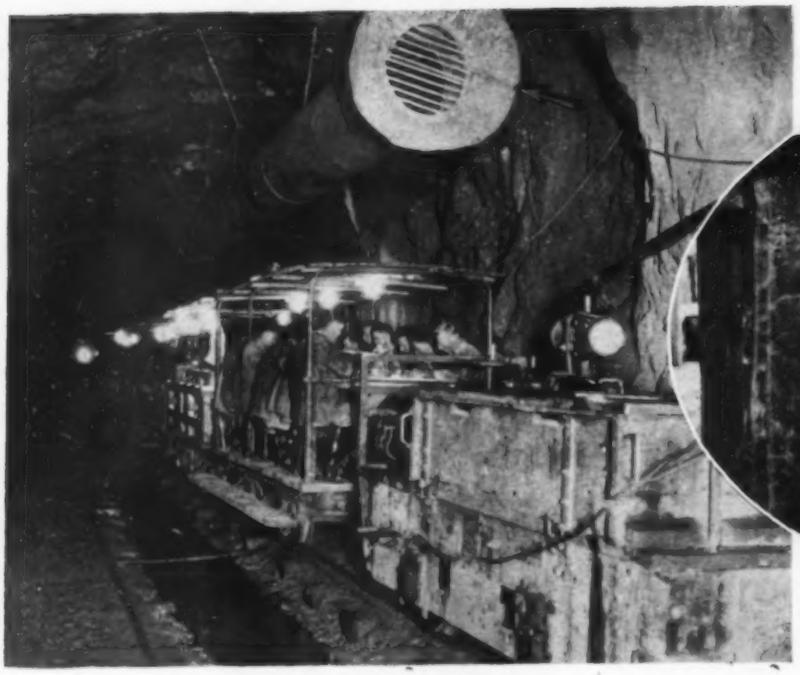
SECOND ARCH takes form alongside first of thirteen to be erected.



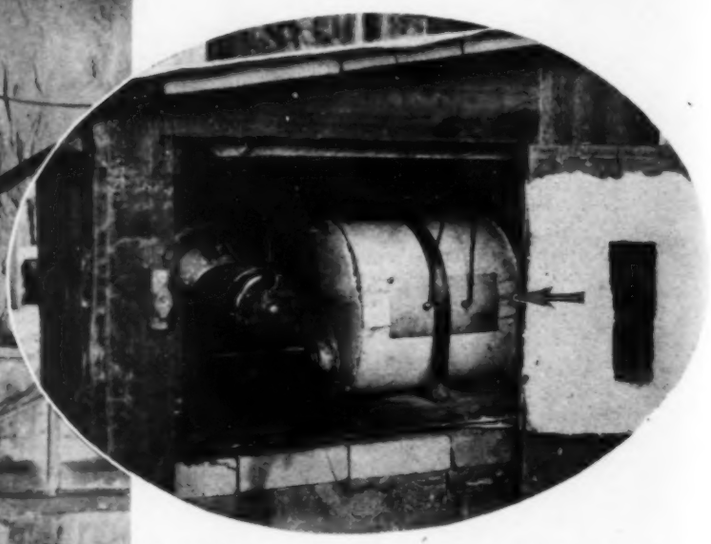


LOCOMOTIVE CRANES with 105-ft. booms and goosenecks, gave vertical reach of 145 ft. in setting intermediate members between trusses. Note falsework bent in place under haunch section.

Management and Supervision — P. W. Litchfield, president, Goodyear-Zeppelin Corp., is the chief executive in general charge. Technical and construction matters are under the supervision of W. C. State, chief consulting engineer for the Goodyear Tire & Rubber Co. and the Goodyear-Zeppelin Corp. Dr. Carl Arnstein, vice-president and director of engineering of the corporation evolved the idea of the airship factory and developed the exterior curves of the building, which then was designed by Wilbur Watson & Associates, of Cleveland, under the direction of Wilbur J. Watson. The Watson organization also is doing the field engineering. Those in charge at the job are R. W. Vail, supervising engineer, Goodyear-Zeppelin Corp.; R. W. Stuck, resident engineer, Wilbur Watson & Associates; and H. Curtis, superintendent, American Bridge Co.



1 ENTRANCE GUARD (*left*) on heading end of blower pipe for tunnel ventilation.

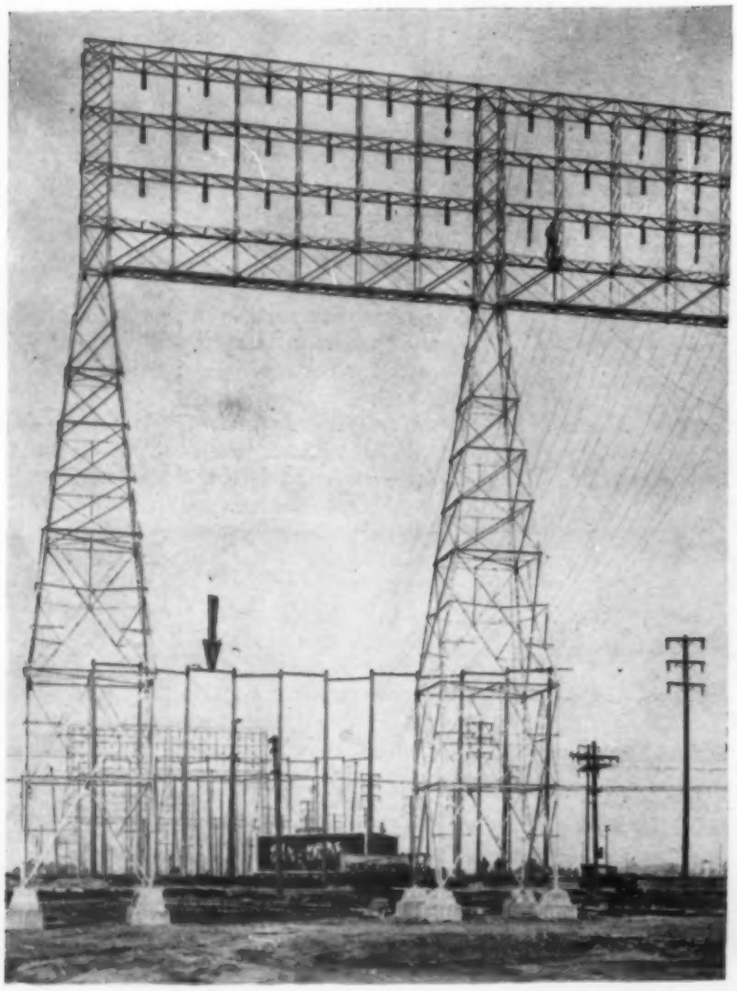


2 ELECTRIC HEATER prevents freezing of blasting caps in storage house during winter.

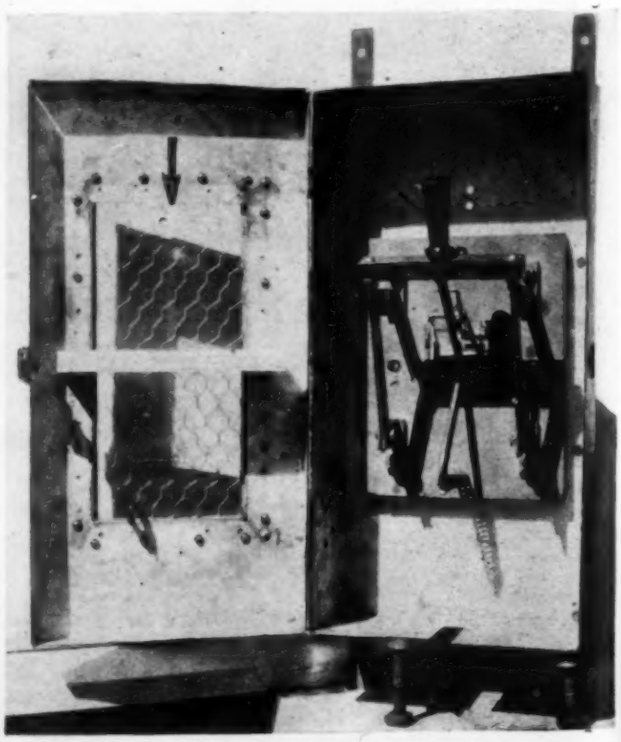
9 EXAMPLES OF SAFETY

By S. C. HAVER, JR.

Chairman, Accident Prevention Committee, Southern California Edison Co., Los Angeles, Calif.

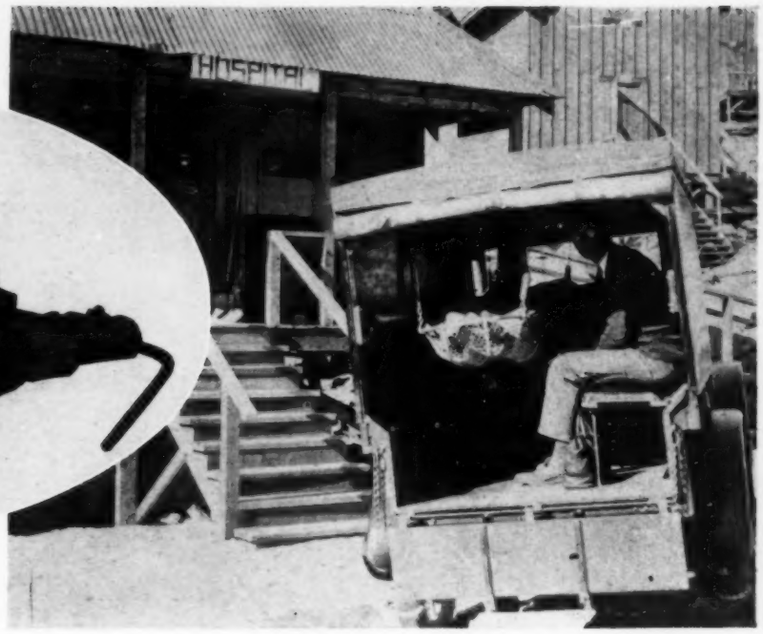


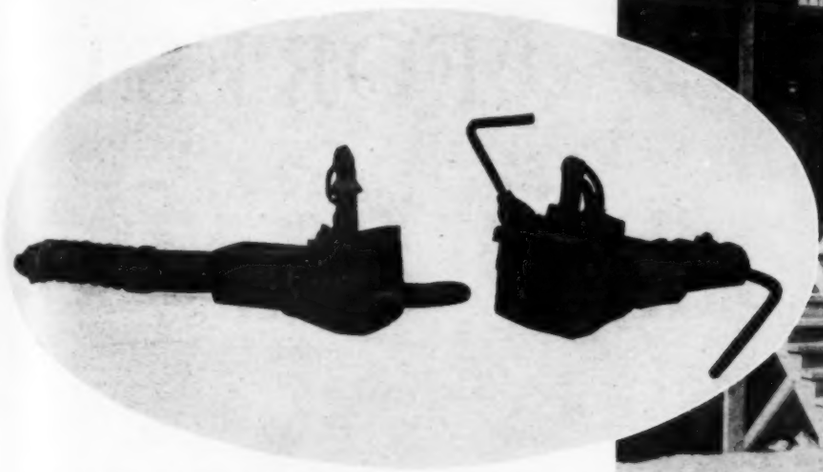
3 HORIZONTAL GUARDS on poles prevent new transmission line wires from coming in contact with existing "hot" lines while being strung.



4 BOX ENCLOSURE to protect electric switch on line for tunnel blasting. Tunnel foreman has key to lock on box door.

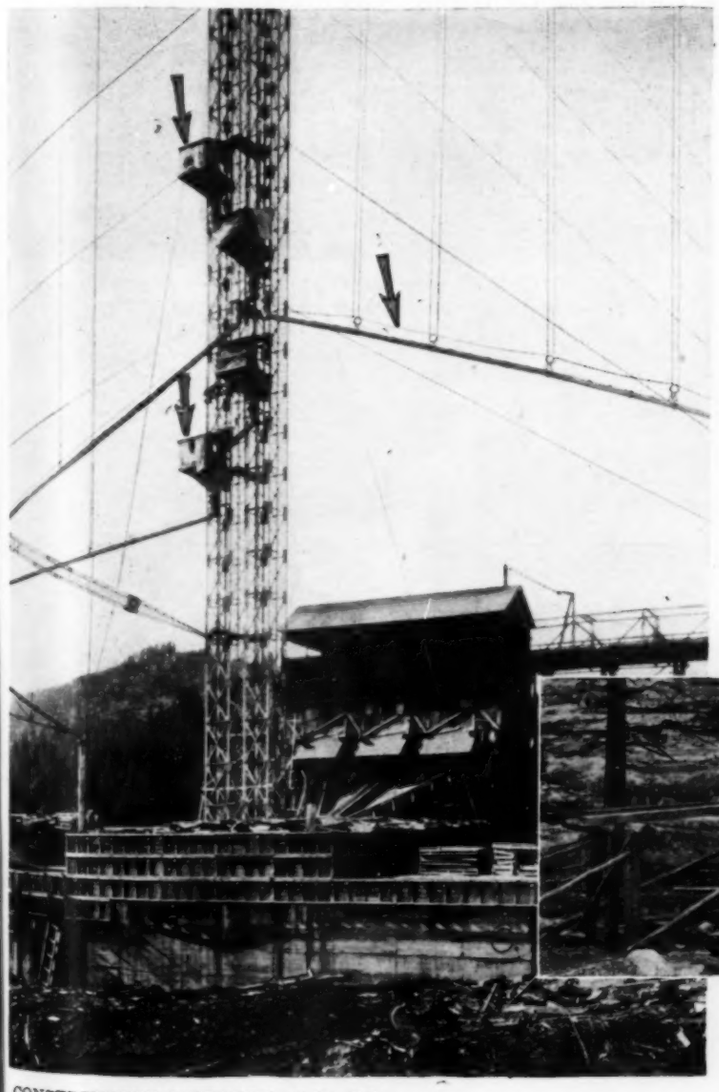
5 DRESSING STATION (*right*) and ambulance insure prompt attention for injured workers.





6 AUTOMATIC COUPLER for tunnel muck cars removes hazard of brakeman standing between cars during coupling.

ON HYDRO-ELECTRIC JOB



7 HOUSING (*left*) above hoppers on concreting tower protects gate tender. Safety hand lines guard chute rider.

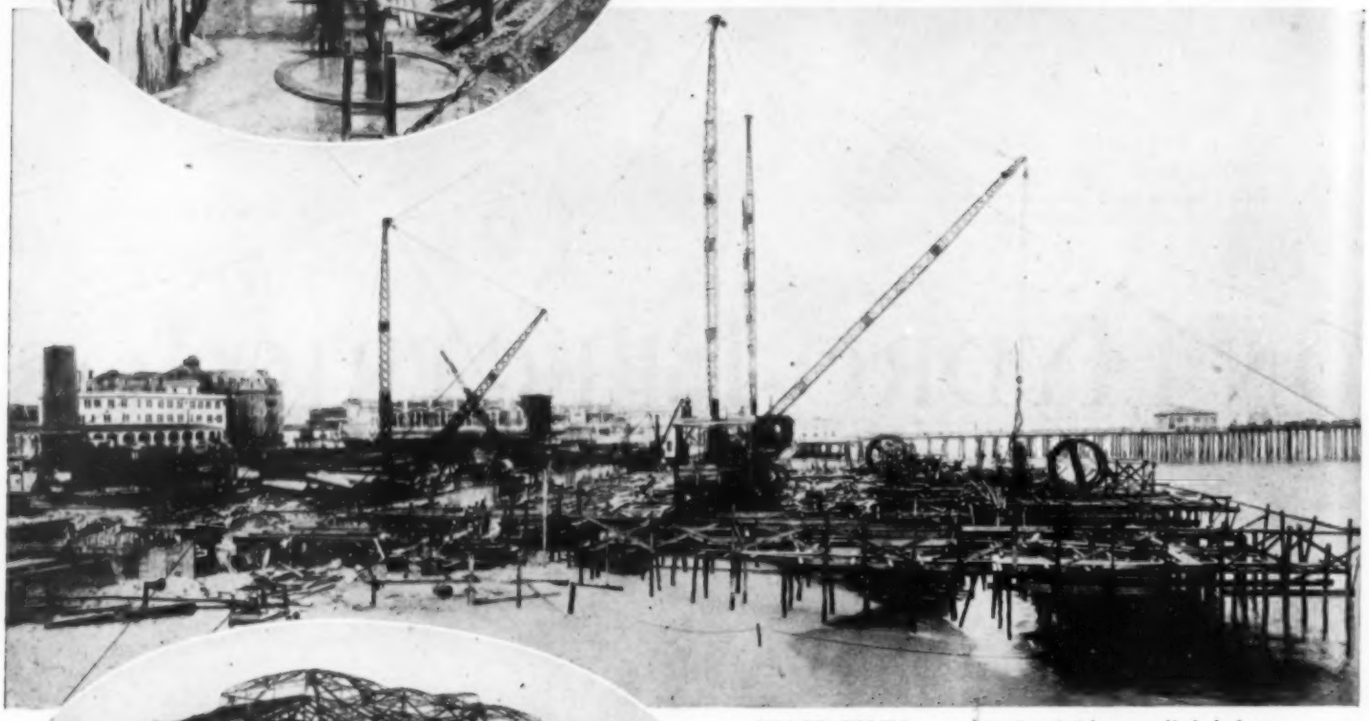
8 BARRING DOWN loose rock in tunnel is first safety operation after round is shot.

9 GUARD FENCE keeps men off partially completed construction trestle.

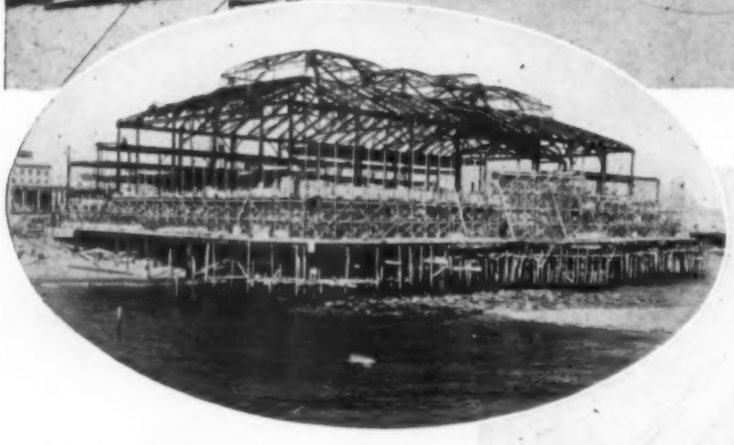
Oceanside Casino at Asbury

"FOREST"

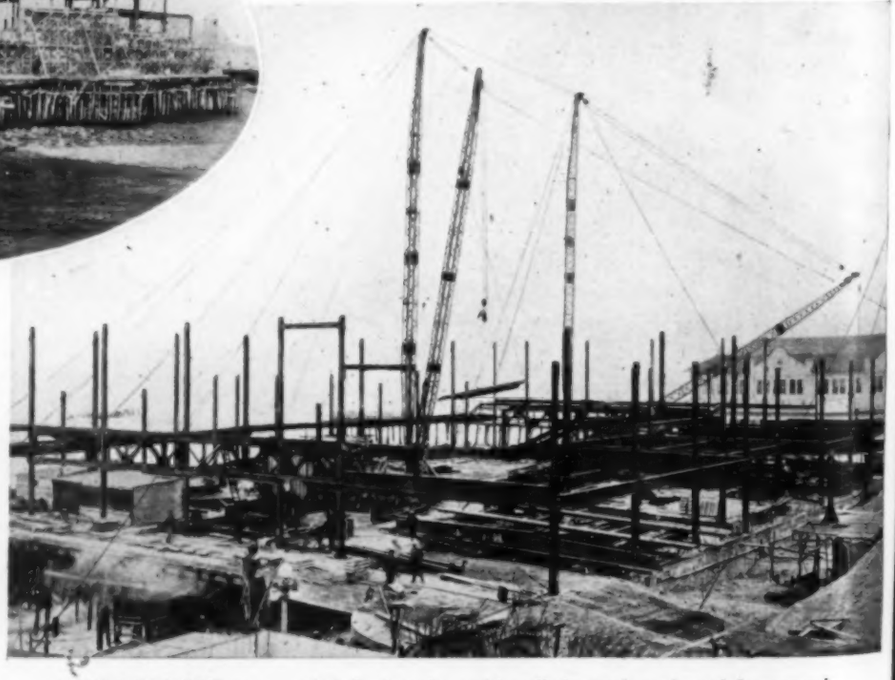
SETTING FORMS *(left)* for the heavy concrete seawall under Casino.



WOOD PILES were jetted and driven until their bottoms were 30 ft. below mean low water.



CASINO is supported above ocean by concrete-capped piers consisting of clusters of thirty piles.



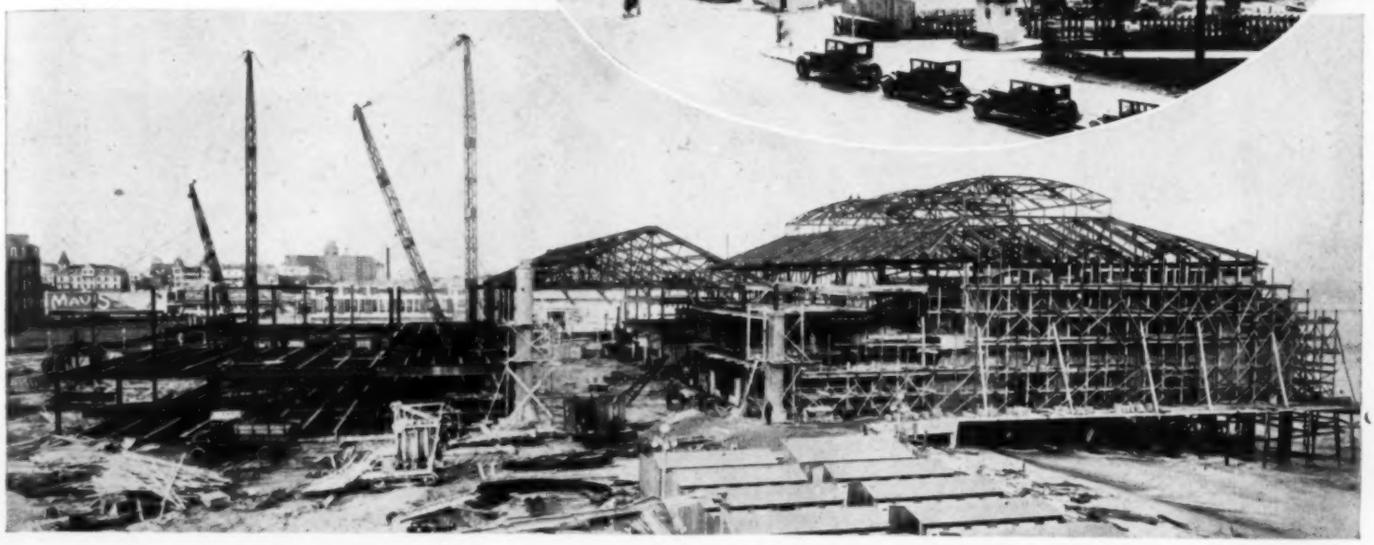
GUY DERRICK commanded Casino site and handled erection of steel framework.

A "FOREST" of wood piles in clusters of from half a dozen to forty or more capped with blocks of concrete form the footings for the 70 piers supporting the new Casino on the ocean front at Asbury Park, N. J. The job executed under a general contract by De Riso Bros., Inc., of New York, included three interconnected structures: A main Casino, 300x168 ft. in plan, on the beach; an arcade building back from the

Park, N. J., Supported by

OF PILES

GYPSUM SLABS were used to roof the arcade structures back of the Casino



PROJECT includes three structures (left to right): arcade building, covered boardwalk, and Casino.

waterfront, and a covered boardwalk.

For the principal operations of pile driving, concreting and steel erection the contractor installed three guy derricks, supplemented by a trio of crawler cranes for miscellaneous material handling. Work was begun by driving temporary piles to carry a working platform covering the entire ocean-front site. Pile clusters for the permanent piers then were jetted and driven to depths of 15 to 20 ft. below mean low water and capped with concrete deposited under water by tremie to form footings for a special type of column. These columns consisted of cylindrical cast-iron pipe jackets from 30 to 54 in. in diameter filled with concrete to carry the main deck of the structure—an 11-in. slab of concrete poured from 1-yd. buckets handled by the guy derricks.

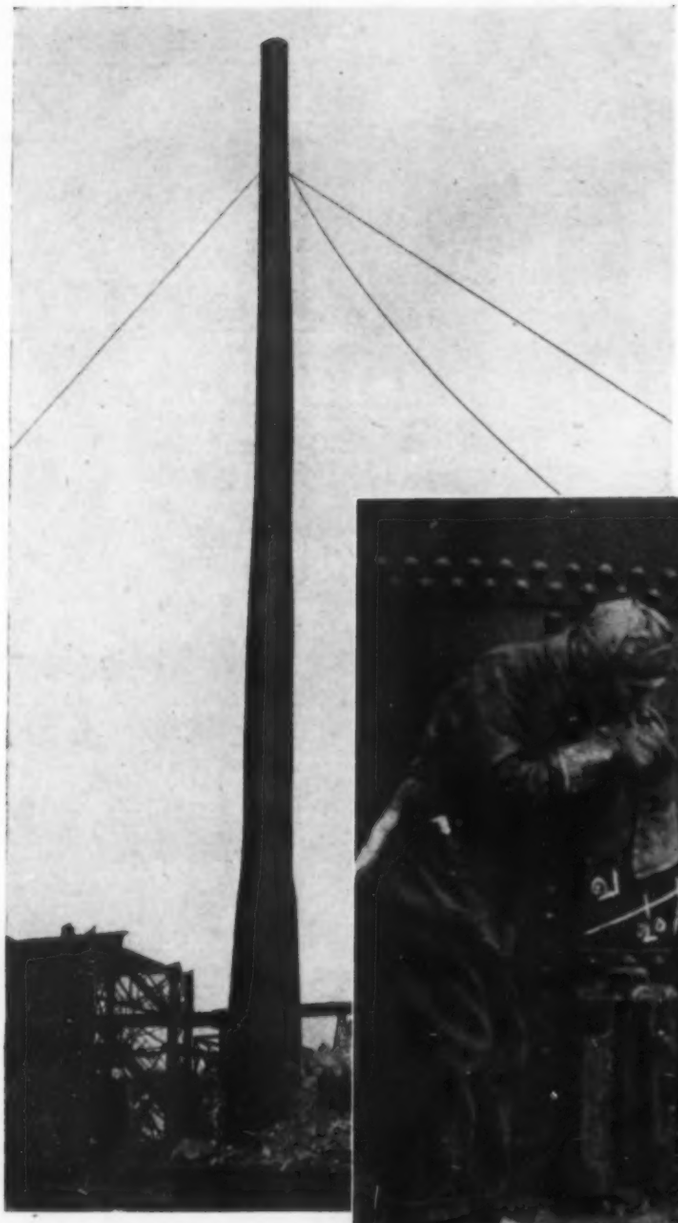
One of the difficult features of the work was the necessity of lowering the ground water 10 ft. to construct a seawall parallel to the shore and extending under the entire length of the Casino. This operation was made possible by using well-points and electrically-operated pumps.

For the general contractors Frank A. De Riso, president, supervised construction. Work on the substructure was handled under a subcontract by the James Ferry Company of Atlantic City. Warren & Wetmore of New York were the architects, in association with Ernest A. Arend, Arthur F. Cottrell and K. McM. Towner. H. G. Balcom was consulting engineer.

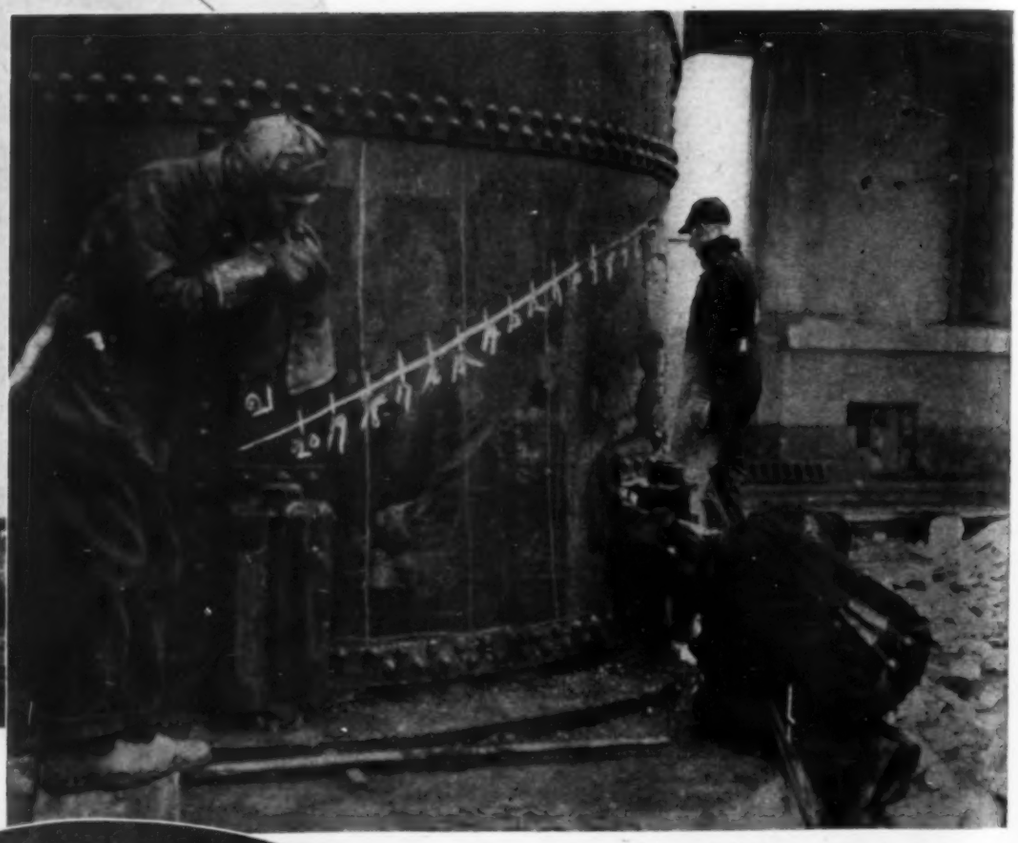
THREE DOMES are built in roof of Casino which is enclosed with dark buff limestone facing.

Step-by-Step
Felling a Brick

By I. W. Ward
Superintendent, Whitney Brothers Company, Duluth, Minn.



1 BEFORE FELLING stack was rigged with guy lines and pull cable.

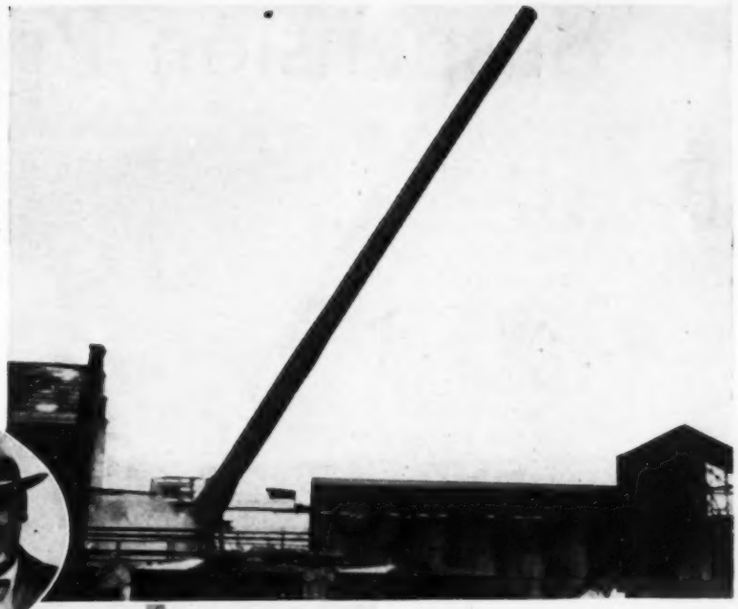


2 STEEL SHELL was burned out in accurately-marked panels at a point just above the base and on the side toward the locomotive which later pulled it down.

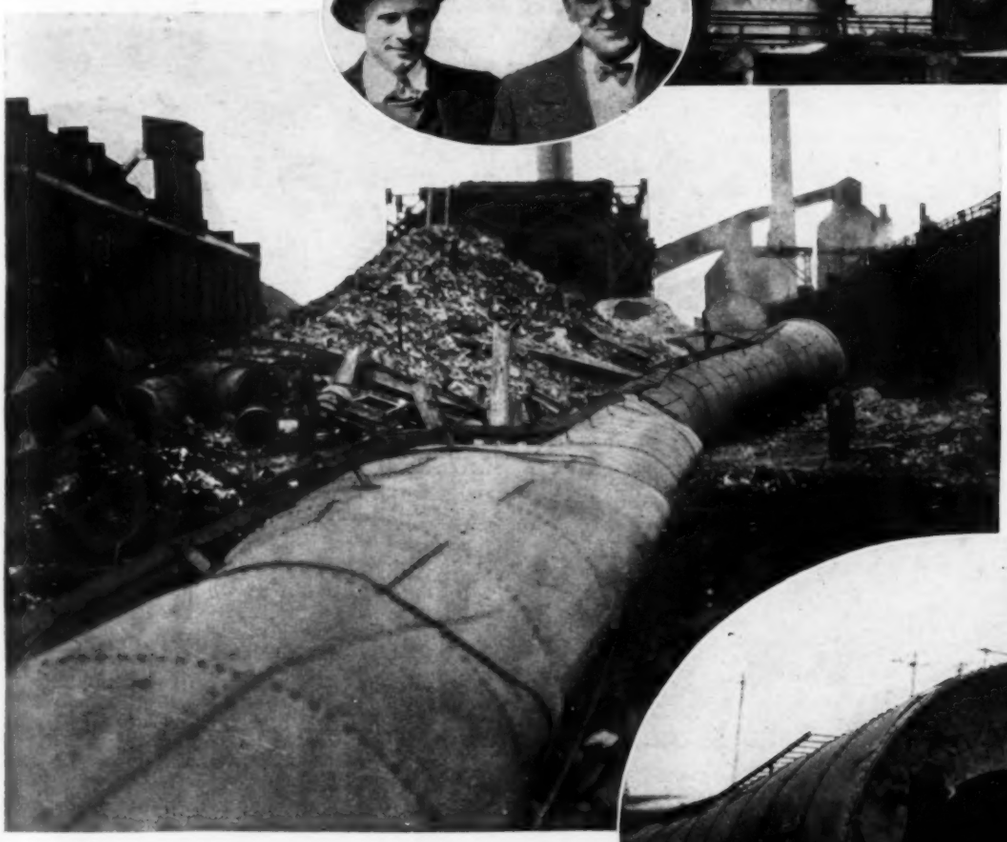
3 WEDGE-SHAPED OPENING through steel and brick caused stack to list in the direction of the pulling locomotive.

Field Methods and Steel Stack

L. HALLOCK (*left*), engineer, and I. W. WARD, superintendent, under whose direction the stack was felled.



4 DOWN SHE COMES! As stack started to fall hemp lines from cables were cut and stack fell as planned.



5 BACK TO EARTH (*left*). Stack on the ground ready to be removed from premises. Adjacent structures made the job of felling the chimney a difficult one.

6 STACK measured 13 ft. in diameter at base and had heavy steel shell and thick brick lining.

AN UNUSUAL method of felling a chimney for the Zenith Furnace Co., of Duluth, Minn., was employed recently by Whitney Brothers Company of that city. The stack was 200 ft. high, 13 ft. in diameter at the base and 6 ft. at the top, and was built of heavy steel with brick lining throughout.

Because of adjacent structures it was necessary to have the stack fall within restricted limits. Guy cables were placed at right angles to the line of fall to prevent the stack from listing during the undercutting operation and were attached to deadmen through hemp rope lines. A heavy pulling cable was attached near the top of the stack and run out 500 ft. in the direction of the line of fall where it was attached to a locomotive.

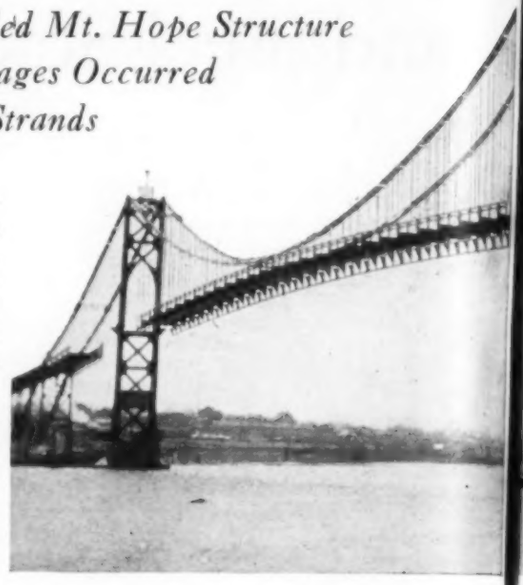
After the steel shell had been burned out and brick removed, as shown on these pages, the locomotive moved ahead at a given signal, and just as it made the pull, the hemp lines of the guy cables were cut and the structure fell exactly as planned.

Suspension Bridge SAVED

How Contractor Dismantled Mt. Hope Structure After Wire Breakages Occurred in Cable Strands

FOR the first time on record the breaking of cable wires has caused the dismantling of long-span suspension bridge structures. This unprecedented event has occurred on both the Detroit and the Mt. Hope (R. I.) bridges. As the wire used in the cables of the two bridges was a new and untried heat-treated product, substituted for the usual cold-drawn wire because of the higher efficiency which laboratory tests demonstrated for it, its failure has no bearing on the safety of other suspension bridges. The methods which the McClintic-Marshall Co., contractor for both bridges, speedily applied to the task of saving and dismantling the Mount Hope bridge are described in the following notes.

The Mount Hope bridge erection stage was the farther advanced of the two structures when continued wire breakages at the strand shoes of both anchorages caused the engineers, Robinson & Steinman, of New York City, to order that the cables be replaced. Construction had reached the point of pouring the concrete floor. Inspections on Feb. 22 and 23 disclosed that 75 per cent of the wires in one of the seven strands of the east cable at the Bristol end had broken at the strand shoe. From this time on continued breaks caused increasing anxiety concerning the safety of the bridge and the contractor used all speed in applying measures to save the structure.

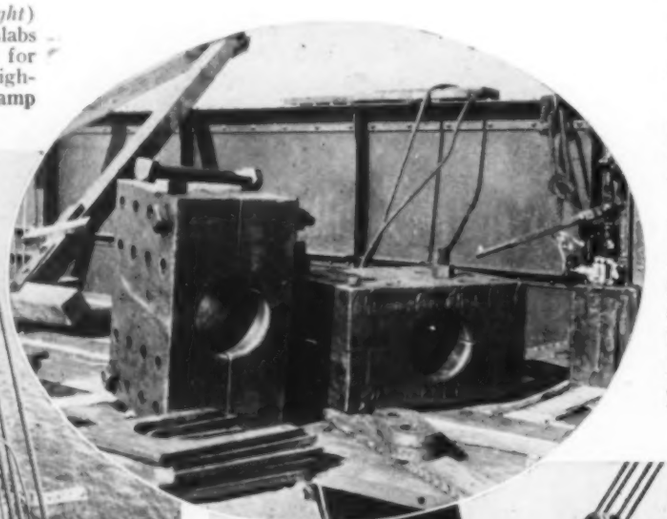


Description of Bridge—The Mount Hope bridge is a privately owned highway toll structure crossing an arm of Narragansett Bay 15 miles south of Providence, R. I. It has a 1,200-ft. main span, with 135-ft. channel clearance, and 504-ft. side spans. The main towers, of the fixed-base, flexible type, rise 284 ft. above mean low water. Cable bents are placed at the shore ends of the side spans. From these bents the cables slope down sharply to the anchorages. The length of the bridge, from anchorage to anchorage, is 2,648 ft.

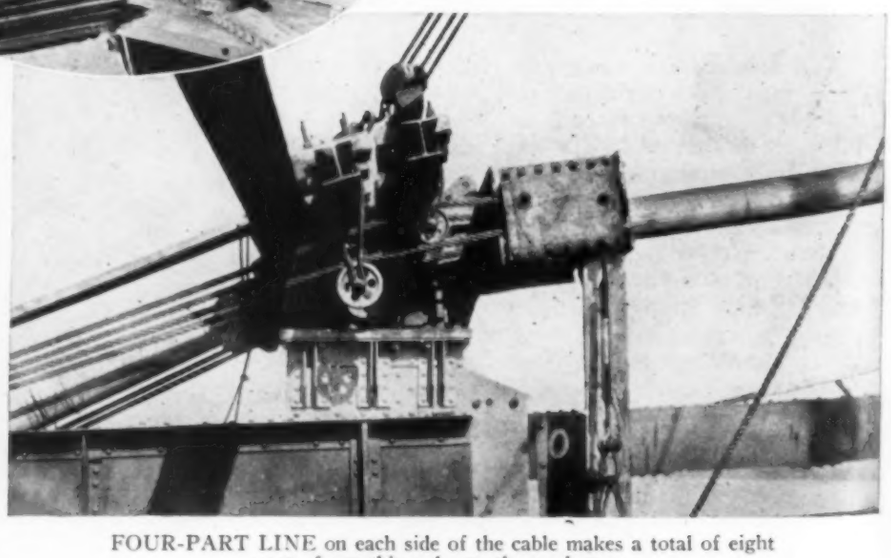
Each of the two cables, spaced 34 ft. apart, consists of seven strands of 350 No. 6 heat-treated and galvanized wires.

Relief Measures—A system of hold-backs was devised to take part or, if necessary, all of the stress from the main cables. The hold-backs consisted of yokes placed over the cable and tied back to the anchorage by wire ropes. Ropes from one type of hold-back, placed against the saddles on the cable

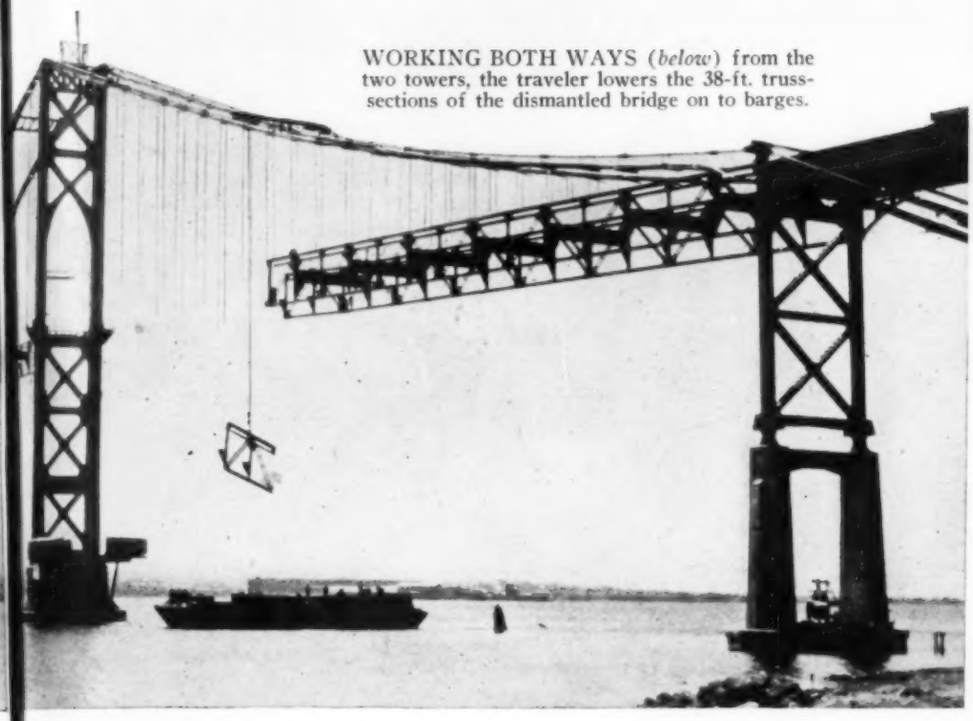
CABLE CLAMPS (*right*) were machined from steel slabs to save the time of waiting for castings to be made. High-tension bolts lock the clamp blocks on the cable.



JACKING DEVICE puts stress on cable hold-back ropes. Hold-back yoke itself is not visible.



FOUR-PART LINE on each side of the cable makes a total of eight parts from this yoke to the anchorage.



WORKING BOTH WAYS (*below*) from the two towers, the traveler lowers the 38-ft. truss-sections of the dismantled bridge on to barges.

bents, were tightened by means of turnbuckles, while the ropes of the second type of hold-back, placed on the cable between the cable bent and the anchorage, were stressed by hydraulic jacks and were held in strained elongation by large slab cable clamps held by high-tension bolts set behind the yokes.

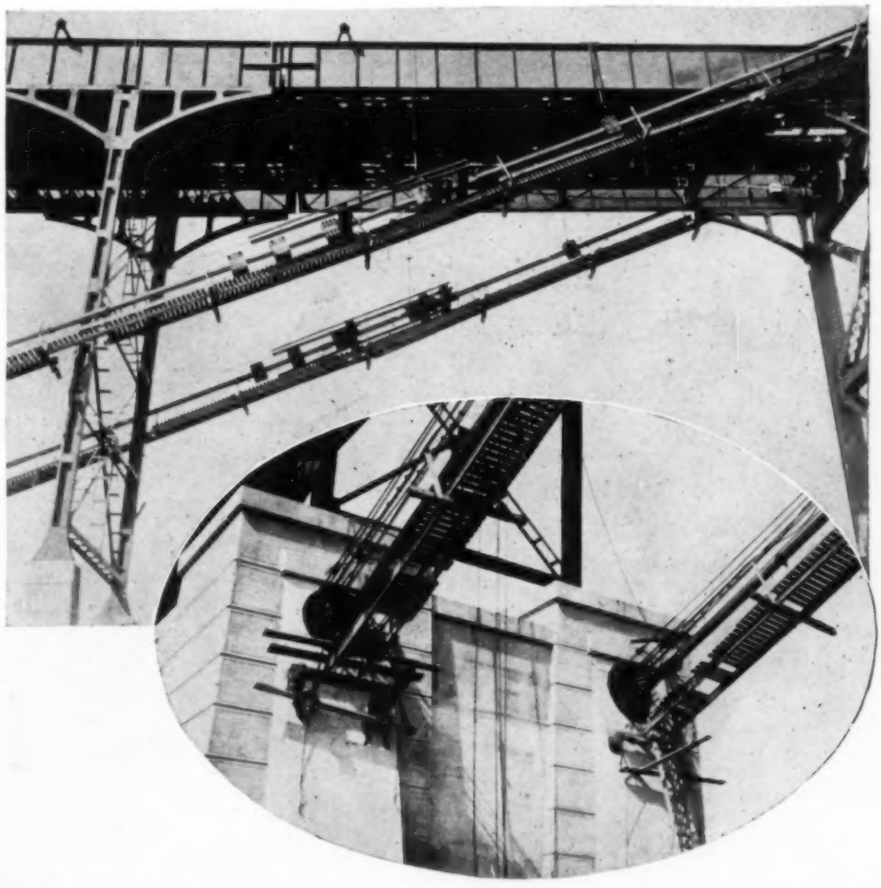
The yoke at the saddle of the cable bent consisted of two I-beams placed flat across the cable, one above and one below, and connected by bolted plates. On each side of the cable and between the I-beams were two sheaves, also in flat position, each pair turning on a pin seated in the webs of the I-beams. Around each sheave was passed a $1\frac{3}{4}$-in. wire rope from the anchorage. There were thus eight parts to the cable connection between the yoke and the anchorage. Each part was fitted with a turnbuckle.

The method of developing the stress in the hold-back cables was ingenious. A study of the photographs will help to clarify the explanation. Three yokes of steel beams were placed across the cable. To the bottom yoke were attached the ends of a two-part cable from an anchorage eyebar. The top and bottom yokes were connected by heavy angles so that they formed the ends of a rectangular steel frame with the third yoke inside it. This middle yoke was in contact with the angles but was not bolted to them. It rested against a heavy clamp on the cable. Two hydraulic jacks inserted between this stationary yoke and the top yoke were run up to 50 tons, putting a corresponding load on the hold-back cables. A second clamp placed on the cable behind the bottom yoke permitted release of the jacks after the yoke had been shimmed against the clamp and the removal of the bolts connecting the angles to the bottom yoke. Thus the load was transferred from the middle yoke to the bottom yoke, and the two upper yokes were free to repeat the operation.

To save time in making the clamps for these hold-backs the heavy steel blocks which form the halves of the clamp were milled from steel slabs readily obtainable. They were fastened over the cable with high-tension bolts. All the hold-back cables were $1\frac{3}{4}$-in. diameter.

While the bridge erectors were making these repairs and providing for possible further failure, they were also relieving the cables of part of the load on the bridge. Reinforcing steel, riveting material, and floor forms were removed from the bridge while splices and hold-backs were being installed, reducing the load by 90 or 100 tons. During the same period workmen cut and punched out the rivets with pneumatic tools, replacing the rivets with bolts. All joints had been riveted except three in the top chord which needed the weight of the concrete deck to pull them together. About 58,000 rivets were cut out.

No further failure being in evidence by the time the hold-backs and splices had been applied, the contractor saved time by discontinuing the preventive work and concentrating all efforts on

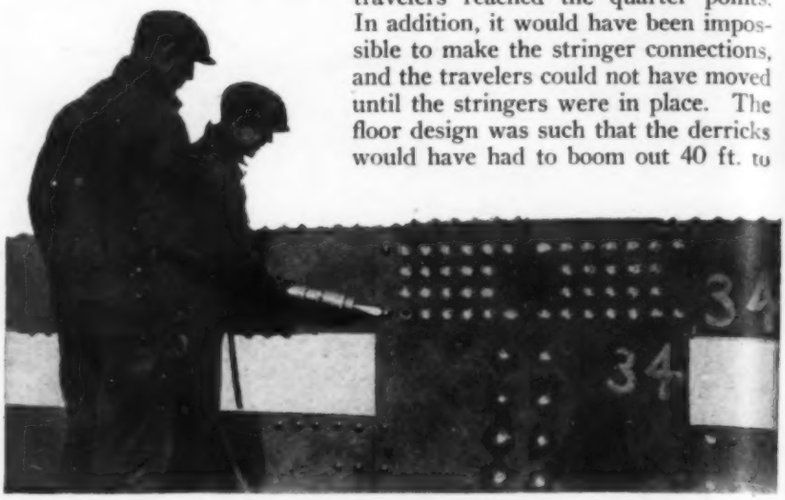


HOLD-BACK PLACED ON CABLE (*above*) between the cable bents and the anchorage. Of the three yokes to be seen on the cable, the bottom yoke is the one to which the hold-back ropes are attached. The two upper yokes form the jacking device used to stress the hold-back cables. TURNBUCKLE (*in oval*) on each part is stressed to its maximum safe capacity of 25 tons, making a total of 200 tons for the eight parts of the hold-back.

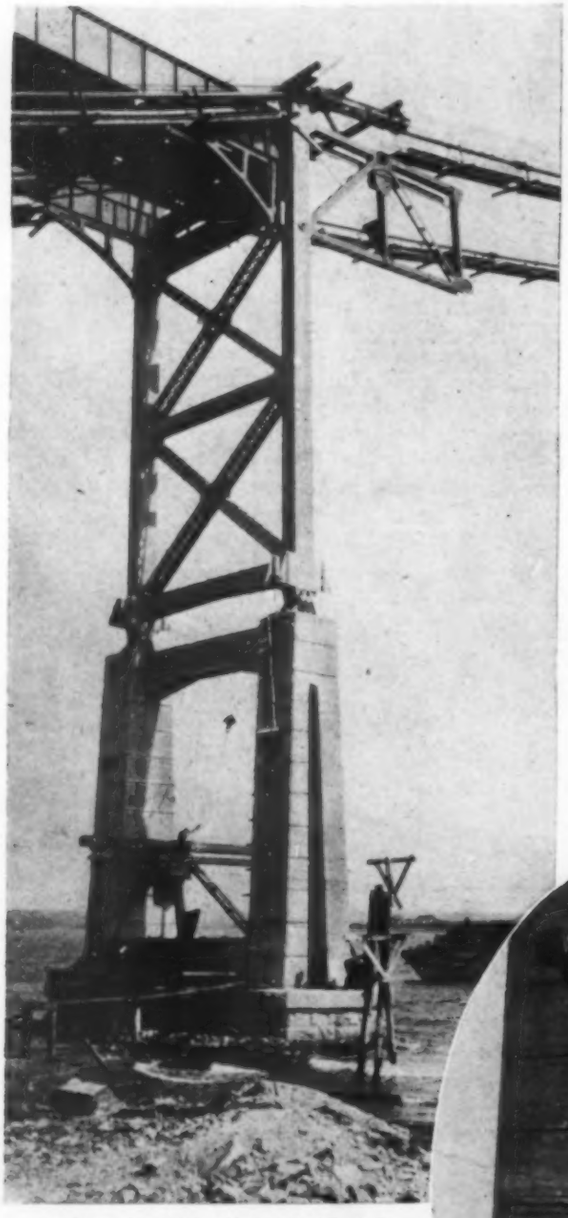
the removal of steel from the structure.

Erection Methods—As the dismantling process for the structural steel was just the reverse of erection, a brief description of the erection methods makes a good basis for understanding the dismantling procedure. Truss members were received by rail in the steel yard on the water front at Bristol, about 2 miles from the bridge. Fourteen to eighteen truss panels were assembled on camber blocking and match-marked, and were then riveted into double panel 38-ft. sections before being loaded on barges. These sections had previously been shop assembled and reamed.

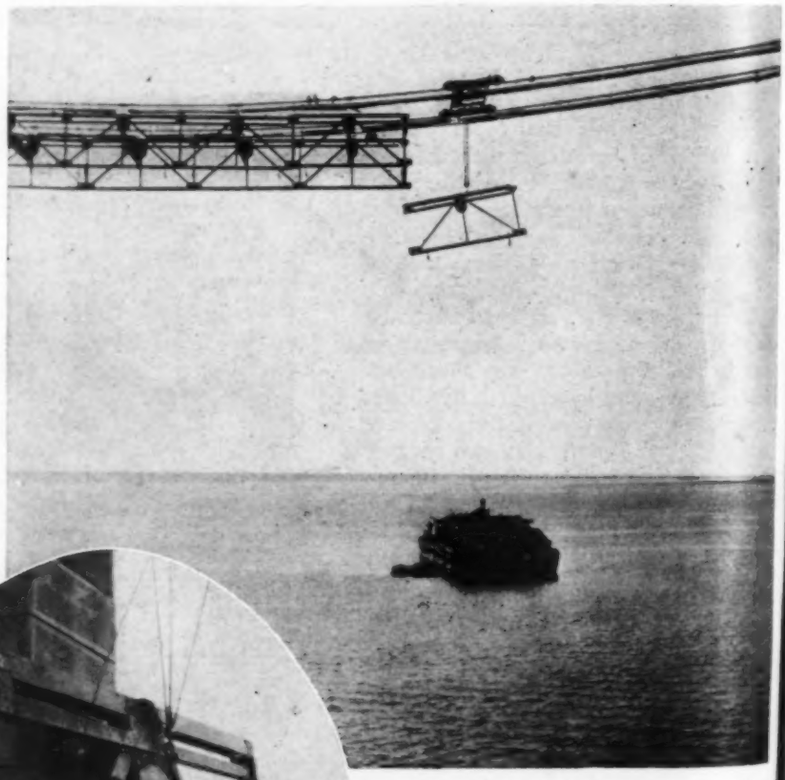
To facilitate the erection of the suspended spans it was deemed desirable to devise some other means than the ordinary derrick-type traveler, moving on the deck. Travelers of this type would have caused such sag as they moved out from the towers on the main span that truss connections could not have been made by the time the travelers reached the quarter points. In addition, it would have been impossible to make the stringer connections, and the travelers could not have moved until the stringers were in place. The floor design was such that the derricks would have had to boom out 40 ft. to set truss sections, floor beams and stringers in advance.



WORKMEN cut off the rivet heads and back out the rivets with pneumatic tools.

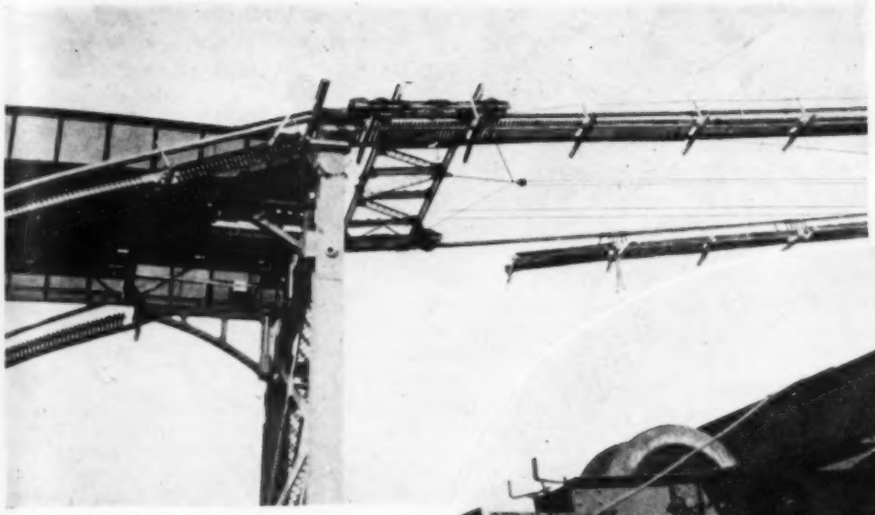


TWO TRUSS SECTIONS (*above and right*) nearest the cable bent are lowered and placed upon the pier.



TRUSS-SECTIONS are lowered away to the barge beneath.

Cable Travelers—As an alternate to the deck derricks a scheme was evolved to place travelers on the cables and operate them by hoists from the piers and approaches. Two travelers were erected on the main span and one on each of the side spans. The frame of the traveler rests on two trucks consisting of two grooved- cast-steel wheels turning on pins between a pair of

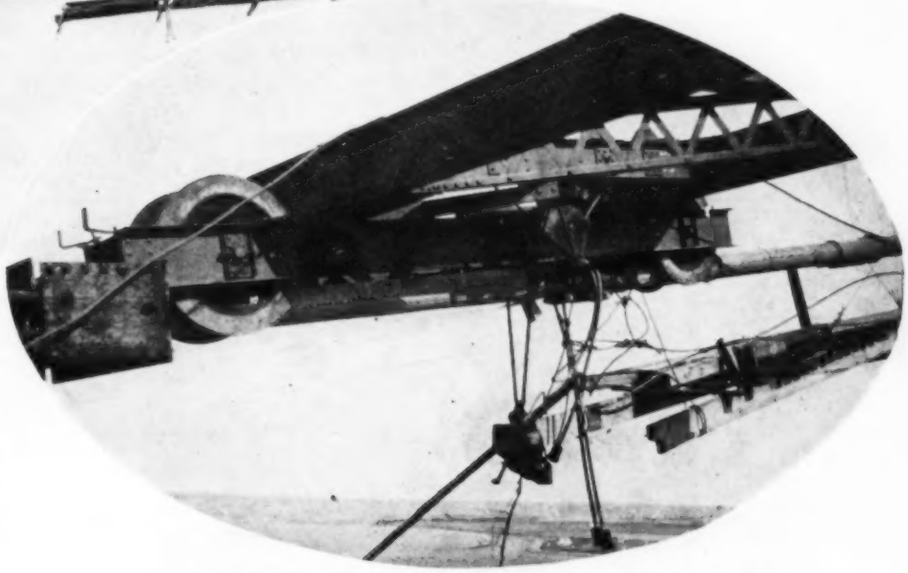


ONE OF THE TRAVELERS on a side span, showing up-haul block and bridle.

15-in. channels. Two 18-in. I-beam laterals rest on the trucks. Four pairs of 12-in. channels, framed into the I-beams, carry the bearings for the hoisting sheaves. A set of sheaves 3 ft. from the center line of the cable is used in placing truss sections, while an interior set 10 ft. 7½ in. off center line of cable carries the falls when floor beams and stringers are to be handled. The groove in the wheels is large enough to pass the travelers over the cable bands.

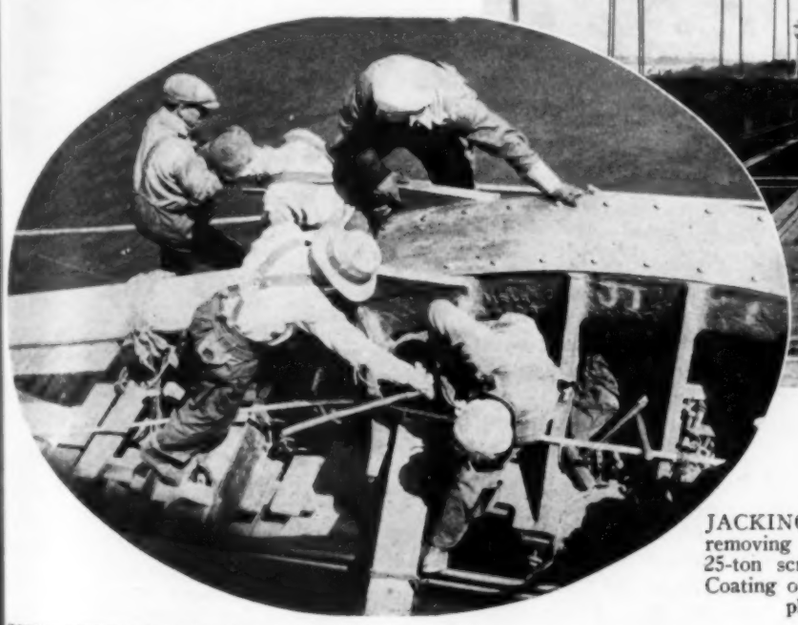
The two-part hoisting fall is becketed to a bridle on the cables, rather than to the traveler itself, in order to eliminate the possibility of moving the traveler and therefore the necessity of tying down at each point when handling loads. Practically all the hoisting lines are ⅞ in. plow steel cable with hemp center. A 1,000-lb. overhauling weight on the hoisting block is necessary to overcome the cable load when the traveler is at the center of the main span with about 850 ft. of cable off the drum.

Each traveler requires four lines: one up-haul cable, one down-haul cable, and two hoisting falls. Two three-drum electric hoists were placed on the pier at the base of each tower. These hoists furnished twelve of the sixteen



GROOVED WHEELS of traveler are able to pass over a cable band. The frame of the traveler rests on two trucks carrying cast-steel wheels turning on pins between a pair of 15-in. channels.

STRINGERS of bridge (*above*), 38 ft. long, rest on floorbeams. Stringer joints are made 2 ft. 6 in. or 4 ft. 6 in. from every second floorbeam, joints of alternate rows being staggered 2 ft.



JACKING BACK SADDLE (*left*) on towers before removing last 10 truss sections from main span. Two 25-ton screw jacks are sufficient to move the saddle. Coating of graphite originally was spread over the base plate before the saddle was placed on it.

drums necessary. The four other drums were obtained by placing two-drum electric hoists on the approaches to operate the up and down-haul cables on the side span travelers. All up-haul cables are three-part lines.

Dismantling Procedure—The travelers first lowered stringers, laterals and alternate floor beams, working at four places to keep an equal tension in the cables on both sides of the towers. Then, working both ways from the towers, they lowered the truss sections.

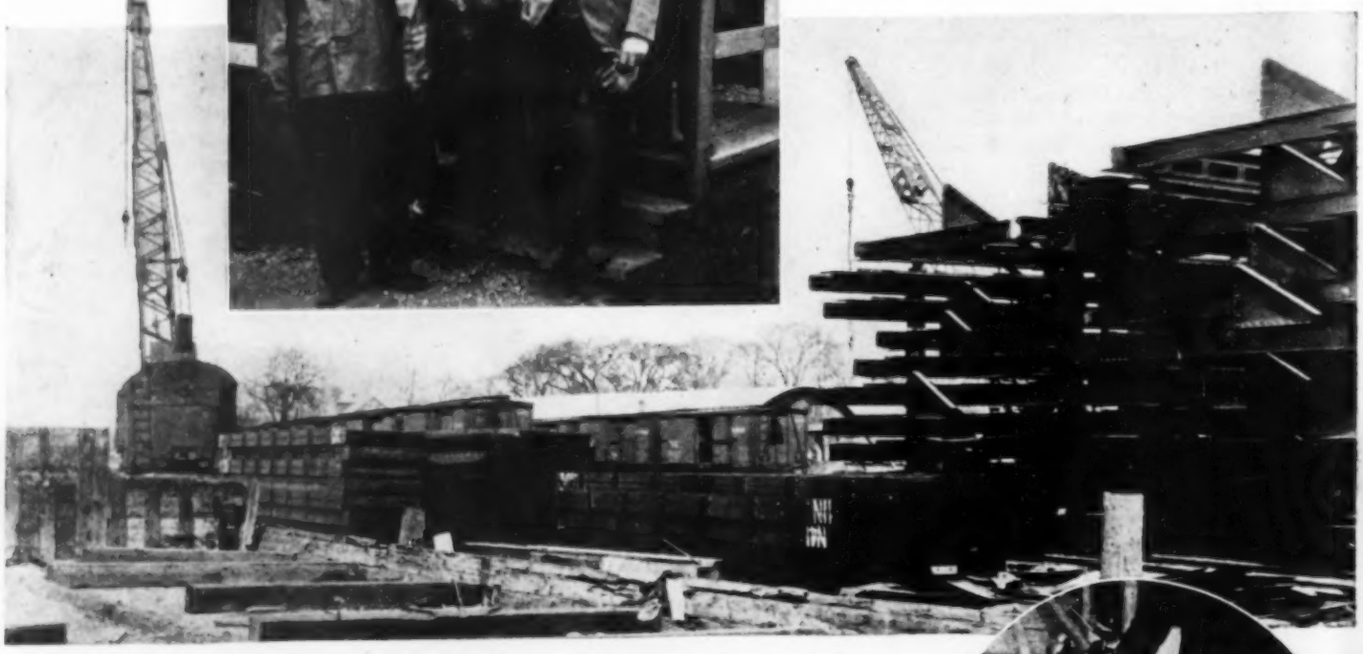
span (all the side span trusses having been taken down previously), the saddles on the towers had to be jacked back 10 in. toward the anchorages—just the reverse of the operation performed during erection.

The Keystone State Corporation, of Philadelphia, which holds a sub-contract for the cable work, removed the suspenders. The number of each suspender was stamped on a socket.

Removing the Cables—To remove the cables, the sub-contractor planned oxy-acetylene torch as shown below.

The members of the engineering and construction organizations involved have made a highly creditable record in the face of the most trying circumstances. Those in charge of the field forces for the various concerns are W. G. Brenneke, resident engineer, Robinson & Steinman; H. G. Veeder, engineer, and H. E. Cartee, superintendent, McClintic-Marshall Co.; and George Greene, superintendent, Keystone State Corporation.

GROUP OF ENGINEERS on the steps of the resident engineer's office. The party of four from the U. S. Bureau of Standards is on hand to investigate the causes of the cable wire breakages. Dividing the group into two rows, with six in the upper row and four in the lower, those present are, reading from left to right (*top row*) H. G. Veeder, engineer and H. E. Cartee, superintendent, McClintic-Marshall Co.; D. G. Letourneau, assistant engineer, Robinson & Steinman; J. R. Freeman, Jr., metallurgist, Bureau of Standards; V. Pitfield, assistant engineer, McClintic-Marshall Co.; W. G. Brenneke, resident engineer, Robinson & Steinman; (*bottom row*) Dr. L. B. Tuckerman, William Osgood and R. L. Dowdell, U. S. Bureau of Standards; and R. V. Milbank, assistant engineer, Robinson & Steinman.



TWO CRANES unload the steel from barges and pile it in order in the yard.

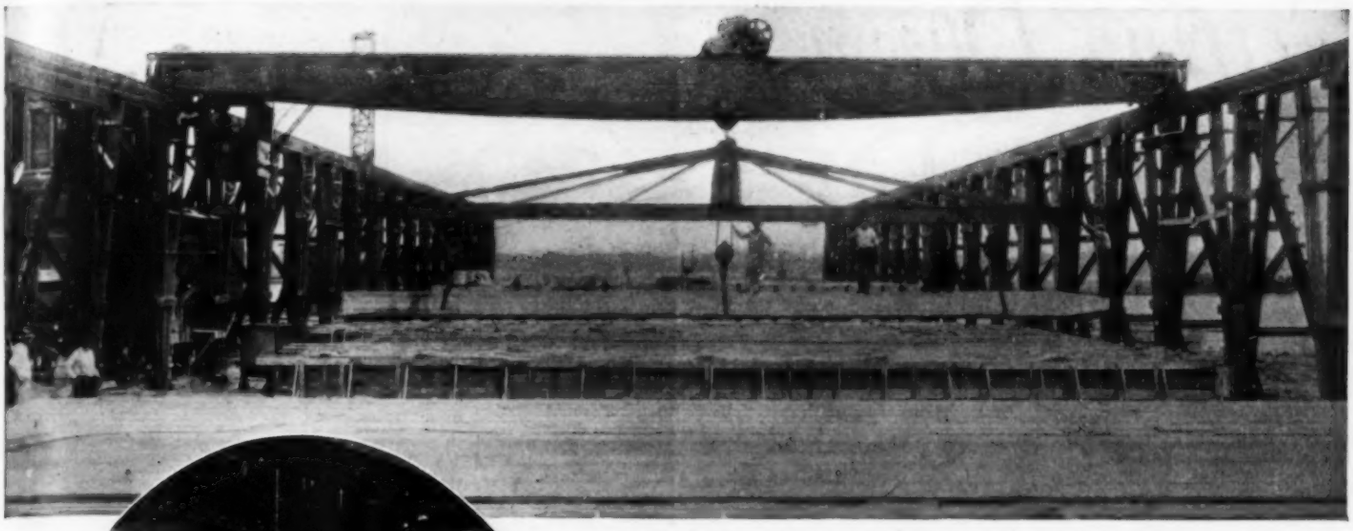
The truss sections hang on suspender sockets inserted in connections on the outside of the top chord. In removing them, the operation was to lift the trusses a short distance, disengage the sockets, and lower away. All steel was piled in the yard at Bristol in the order in which it was taken down, so as to simplify re-erection.

As an example of what can be accomplished on a calm day the McClintic-Marshall forces removed 21 pairs of 38-ft. truss sections and 21 floor beams on April 23, totaling 440 tons of steel.

Before the last 10 pairs of truss sections could be removed from the main

to put an extra tension on one of the two top strands by pulling back on the strand shoe with hydraulic pulling jacks, thus lifting the 350 wires of the strand clear of the balance of the cable. A special yoke for the jacking operation fits over the half strands at both sides and bears on the strand shoe. The pulling jacks are attached to the yoke and anchored over the lower end of the eyebar, thus permitting the removal of the shims so that the strand can be slacked. With the wires lifted clear of the rest of the cable, workmen place blocks under the wires, bind them with seizings, and cut the strand into 15-ft. sections by burning with

OXYACETYLENE TORCHES cut dismantled cable strands into 15-ft. lengths for disposal.



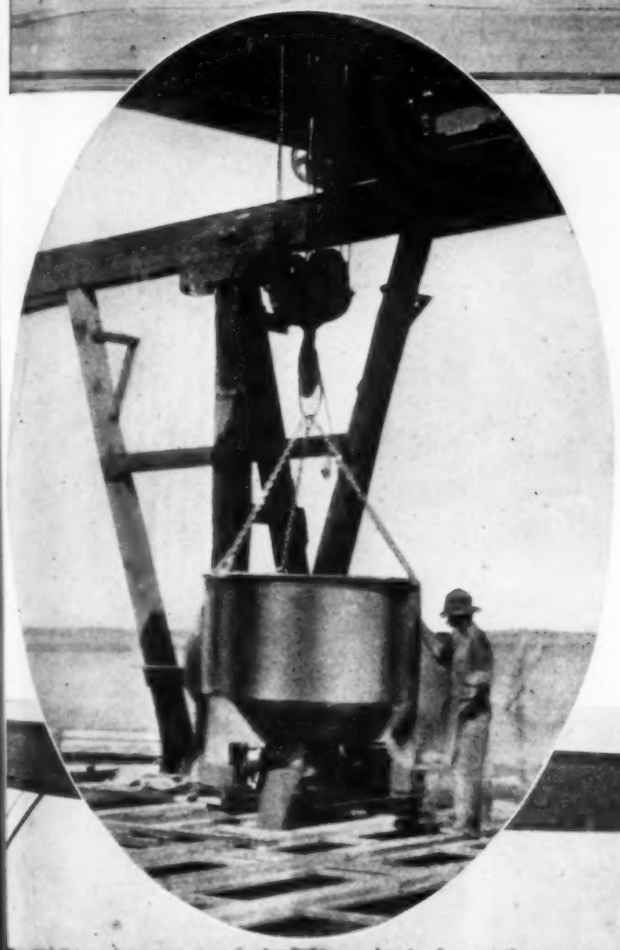
EQUALIZING BEAM, hung from overhead electric crane, uses 3-point suspension to handle 75-ft. piles.

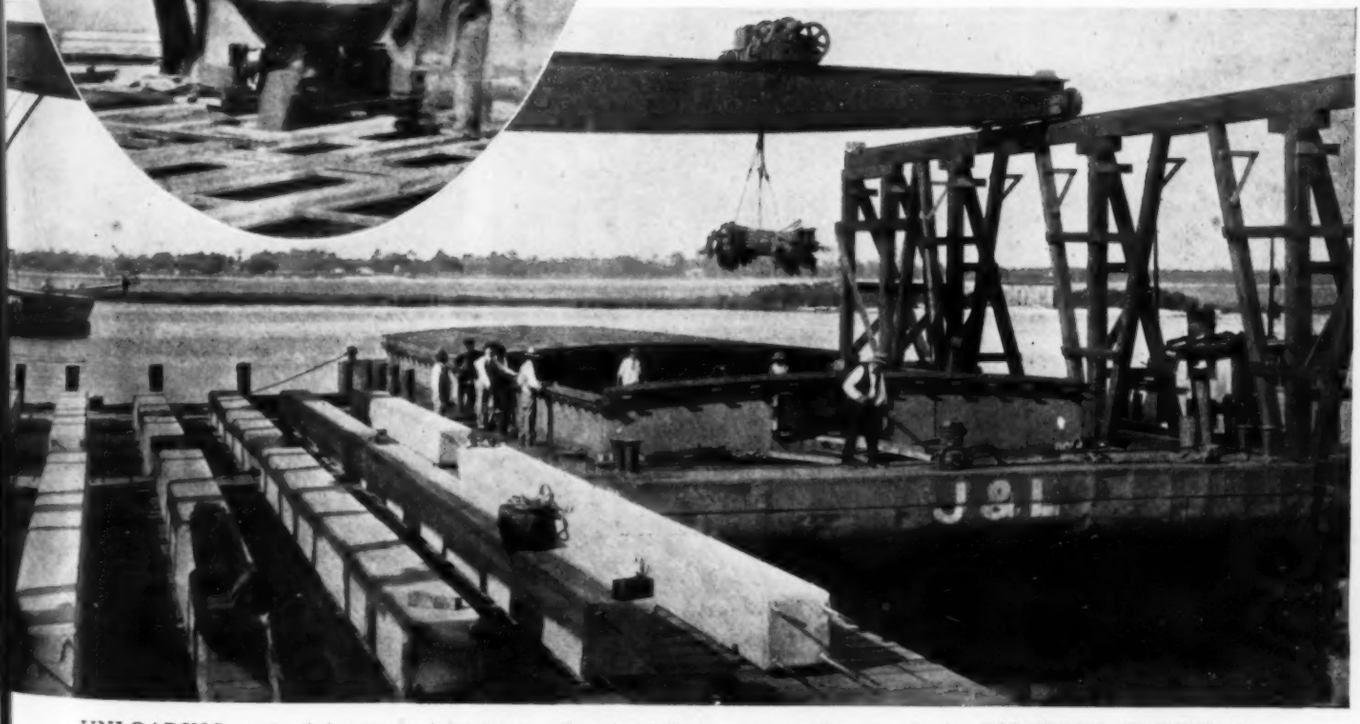
Pile-Casting Yard Served by

VERSATILE CRANE

AT THE concrete pile-casting yard for the Biloxi Bay Bridge, Mississippi, a 1½-mile trestle structure, an overhead electric traveling crane proves to be a versatile machine, performing four operations as follows: (1) Places concrete; (2) handles steel; (3) sets and strips forms; (4) removes and loads cast piles. The crane, a 25-ton unit with 77-ft. span, is equipped with a special equalizing beam with 3-point suspension for handling 24-in. square piles 75 ft. long. H. Larsen designed the plant and J. B. Craig served as project engineer.

Photographs and data from H. LARSEN
Superintendent, Fuller Construction Co., Biloxi, Miss.

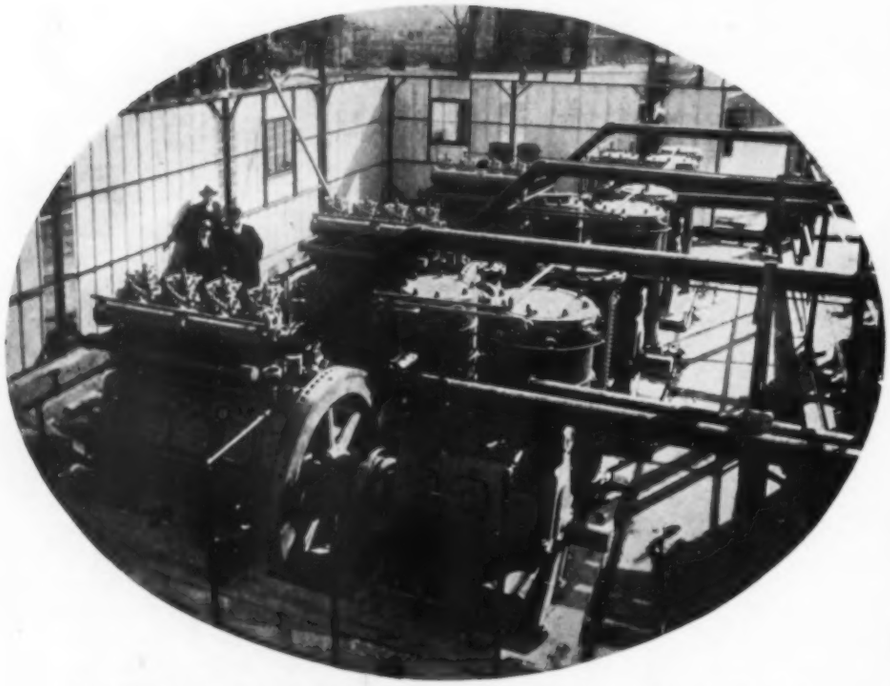




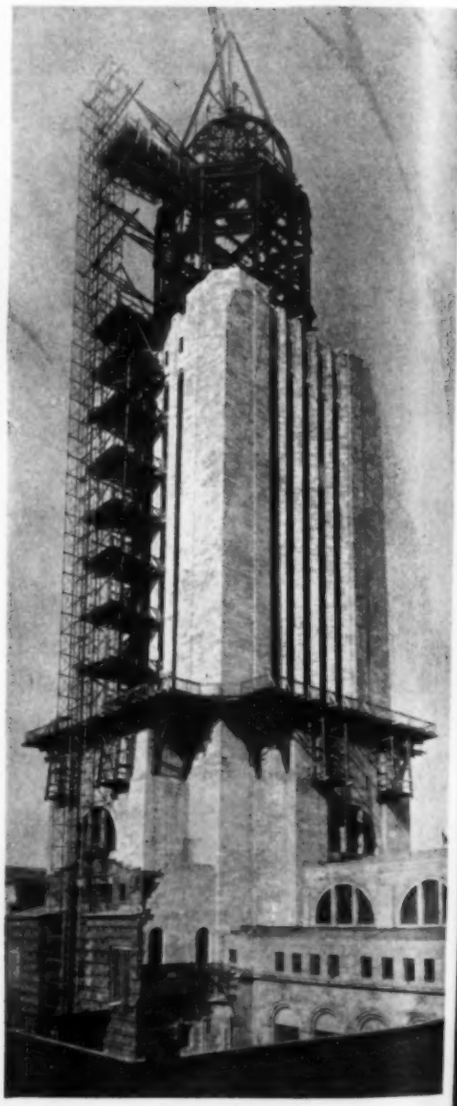
UNLOADING steel reinforcement from barge. Completed 24-in. square piling on wharf. CONCRETE BUCKET *(in oval)* with 3-yd. capacity, delivers concrete into forms under control of only one man.

Getting Down to DETAILS

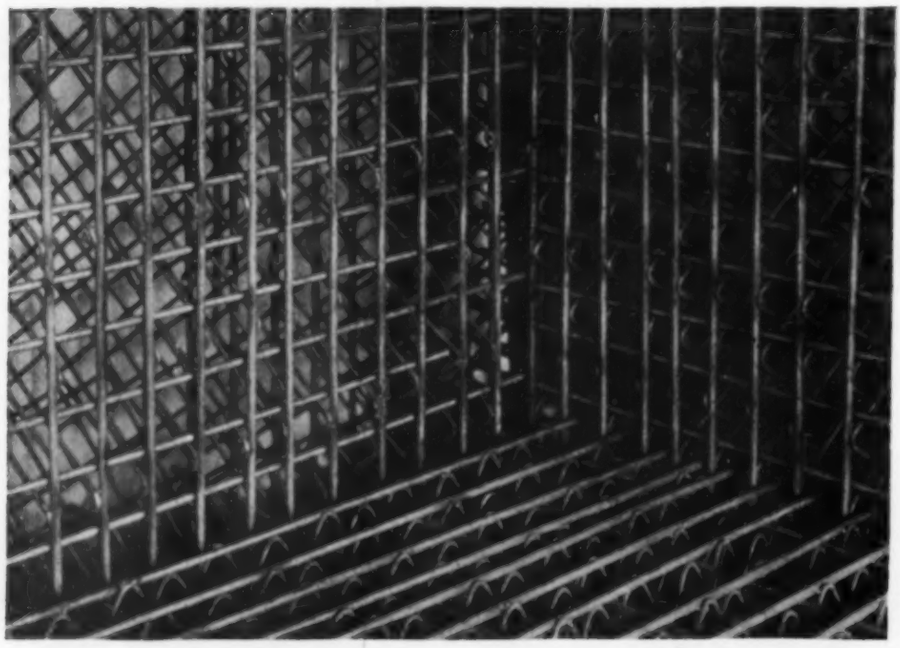
[Close-up Shots of Job Methods and Equipment]



DIESEL ENGINE POWER at low cost operates this compressor plant of three vertical Chicago Pneumatic Tool Co. units recently installed by Lyons & Slattery, Inc., New York subway contractors, on the Eighth Ave. extension under the Grand Concourse. Each engine is of 160 hp.

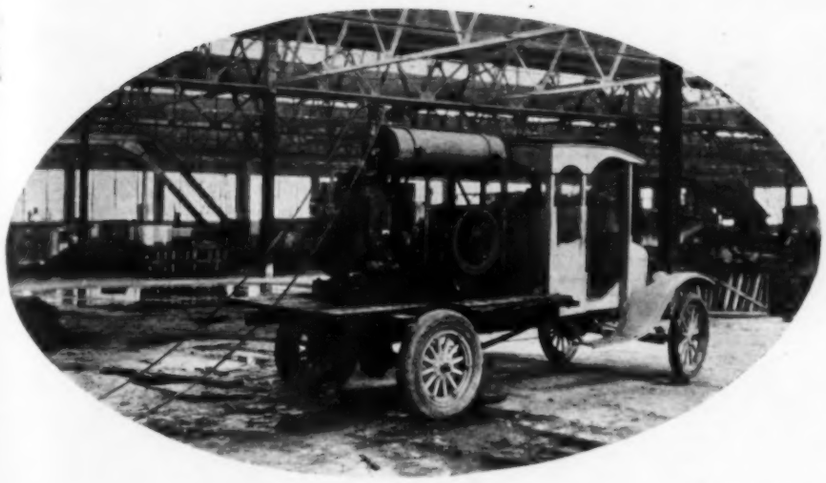


A DOUBLE COMPARTMENT is the feature of this 320-ft. Insley steel builder's tower which is helping Peter Kiewit's Sons, Omaha contractors, complete the imposing shaft of the Nebraska State Capitol at Lincoln.

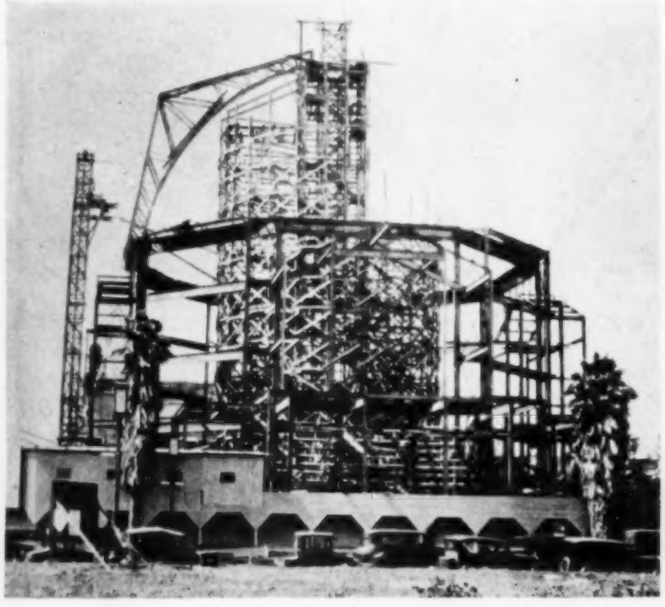


BURGLAR PROOF! Jimmy Valentine himself wouldn't tackle the job of breaking through this web of heavy Massillon steel bank vault reinforcement. Photo shows detail of corner construction and setup of reinforcing units prior to concreting.

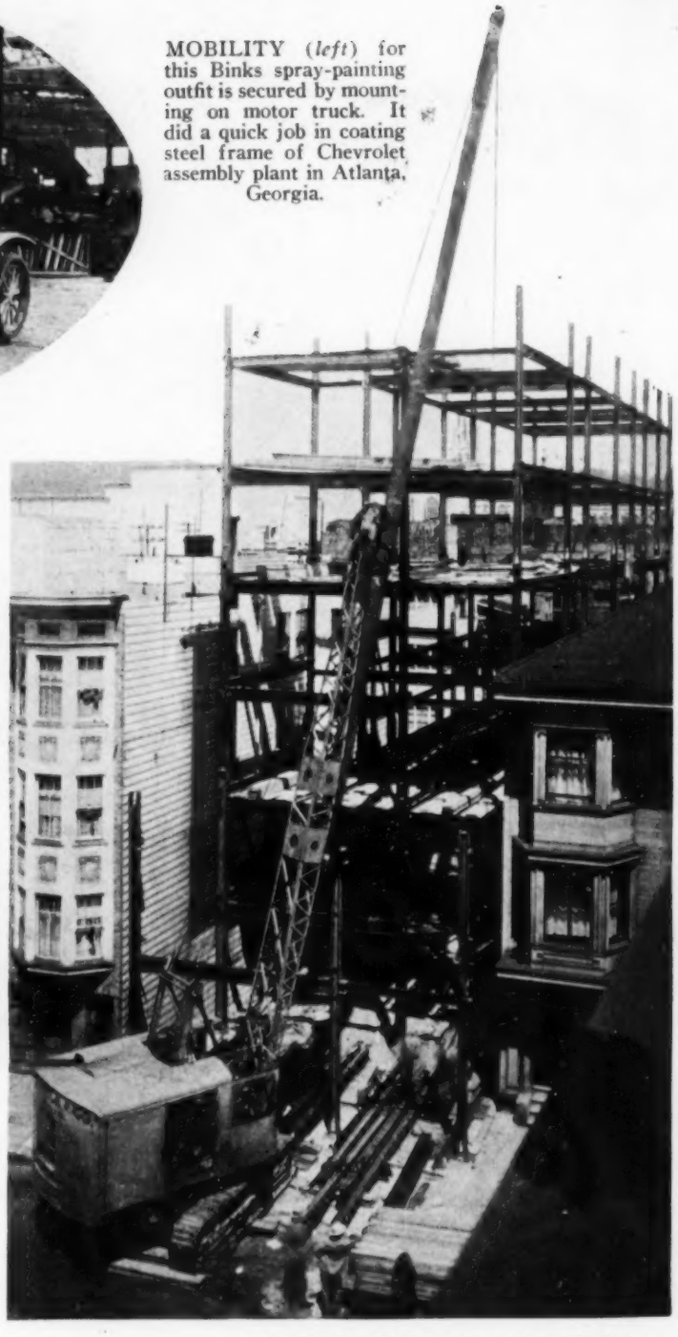
There should be a detail from YOUR work on this page. Why not mail the Editor a snapshot of one of your job Kinks?



MOBILITY (*left*) for this Binks spray-painting outfit is secured by mounting on motor truck. It did a quick job in coating steel frame of Chevrolet assembly plant in Atlanta, Georgia.



FORM-SETTING TEMPLET helps Herbert M. Baruch Corp., Los Angeles contractor, construct thin shell concrete dome for B'nai B'rith Temple. Central tower supports dome rib falsework.



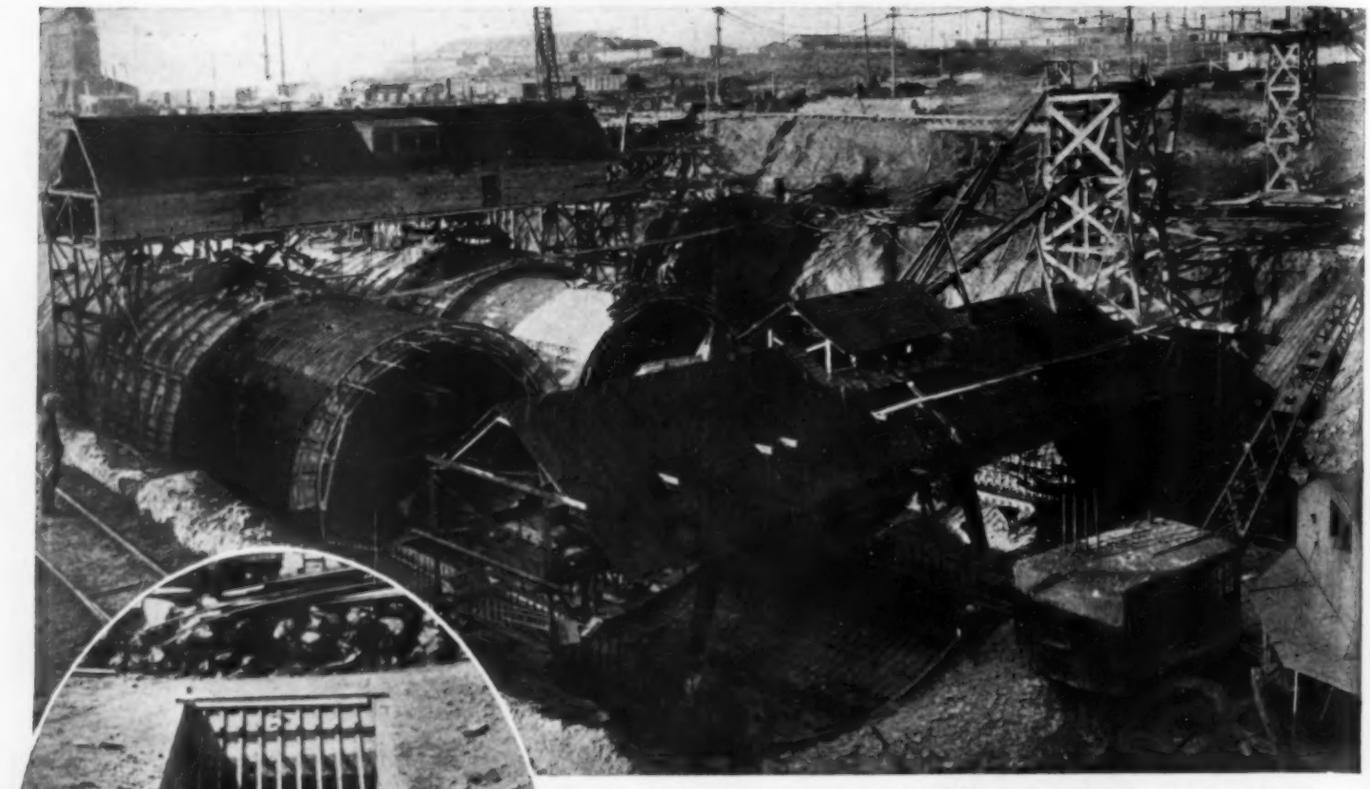
LENGTHENED CRANE BOOM erects steel for 6-story building. Says Joe Gerrick, who handled the job: "The narrowness of the building made a derrick impracticable, so we lashed a 75-ft. wood boom to the 45-ft. latticed boom of a Northwest crane. Starting at back of building we set steel by panels, backing crane toward street." Steel for this 6-story apartment in San Francisco was placed in 4½ days.

Photo from

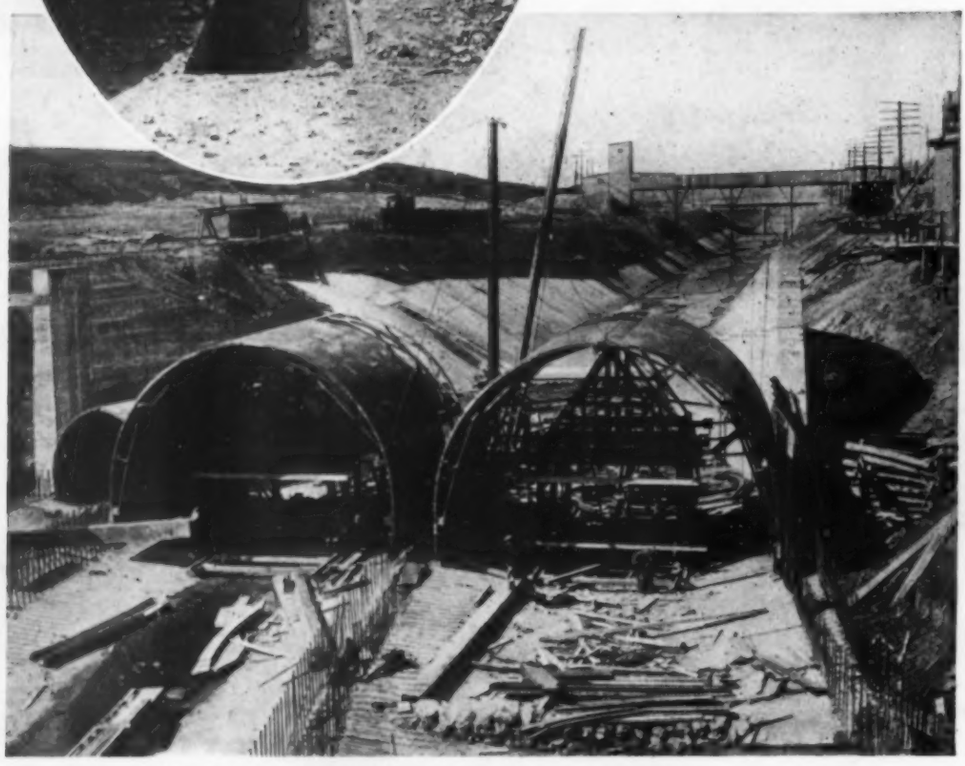
JOE GERRICK

Joe Gerrick & Co.,
Steel Construction,
San Francisco

"THROWING" TRACK behind steam shovels is one of the many jobs handled by this Caterpillar Tractor with bulldozer attachment at work in stripping mine of Traux-Traer Coal Co., De Soto, Ill.



ENCLOSED FOR WINTER WORK. Concrete placing plant on Guthrie section of sewer is protected by movable enclosures. (*In oval*) OPENING for interceptor connection.



COLLAPSIBLE FORMS in place for 29-ft. two-tube sewer section.

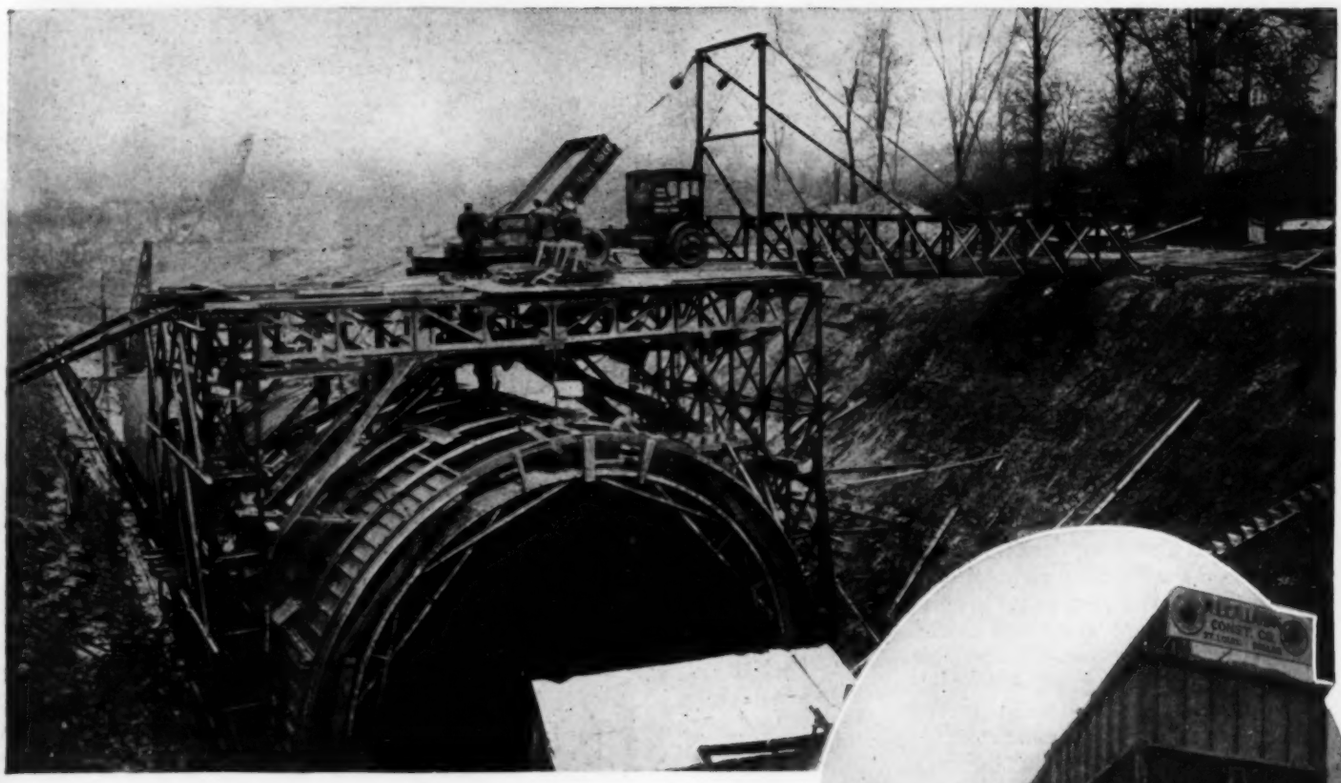
Two Contractors, on Adjoining Sections

EFFECTIVE USE

The Guthrie Job

TWO sections of the River des Peres drainage works being built for the City of St. Louis, Mo., illustrate applications of special methods and equipment on heavy single and double-barrel sewer construction. While the project includes both open flood-way and closed intercepting sewer, the big work now in progress is on the closed sewers.

On Section D, calling for 10,000 lin. ft. of 29-ft. double-barrel horse-shoe shaped concrete sewer at an estimated cost of $2,600,000, A. Guthrie & Co., of St. Paul, hauled concrete by train in 2-yd. buckets from a central mixing plant. A locomotive crane picked up the buckets and discharged them into the hopper of a moving tower feeding belt conveyor and spouts on a gantry which straddled Blaw-Knox collapsible steel forms. For winter operation the plant was roofed and enclosed, as shown in one of the photos. This is believed to be the first case of large sewer construction under movable cover.



BRIDGE carries truck loads of concrete to dumping platform on traveler directly over forms. (*In oval*) CENTRAL PLANT for mixing concrete.

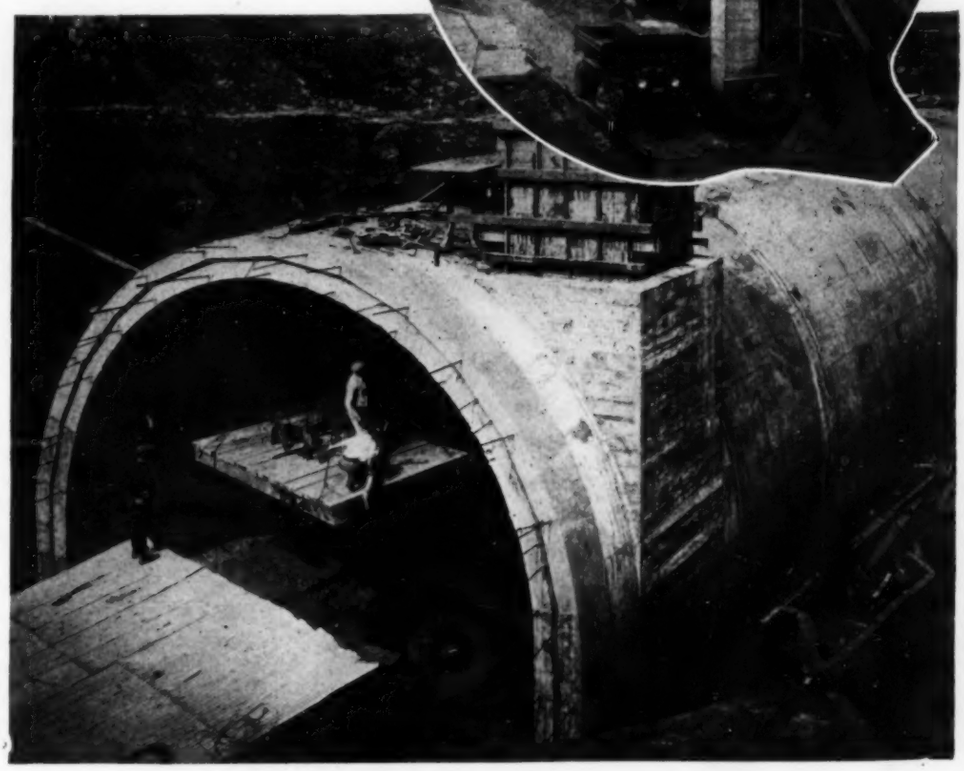
of Huge St. Louis Sewer, Develop

OF HEAVY PLANT

The Callahan Job

ON SECTION E, for 5,000 ft. of single 32-ft. sewer, costing $900,000, the W. E. Callahan Construction Co., of Dallas, Tex., is using four 35-ft. sections of Blaw-Knox telescopic inside forms and one 35-ft. section of outside forms, handled by travelers. The special feature on this part of the project is a bridge over which motor trucks deliver mixed concrete to a dumping platform on the traveler directly over the forms, as shown in the picture at the top of this page.

W. W. Horner, chief engineer of the Division of Sewers, St. Louis, has charge of the River des Peres project, with Thomas Knobel as construction engineer and W. R. Denison as resident engineer. For A. Guthrie & Co. E. H. Bruntlett is superintendent. Mr. Horner made the first survey for the project as a "cub" engineer in 1907, prepared designs in 1916, and now, as chief engineer, has the satisfaction of seeing his project become a reality.



SUSPENDED PLATFORM aids interior surface finish operations.

For Seawall of Concrete

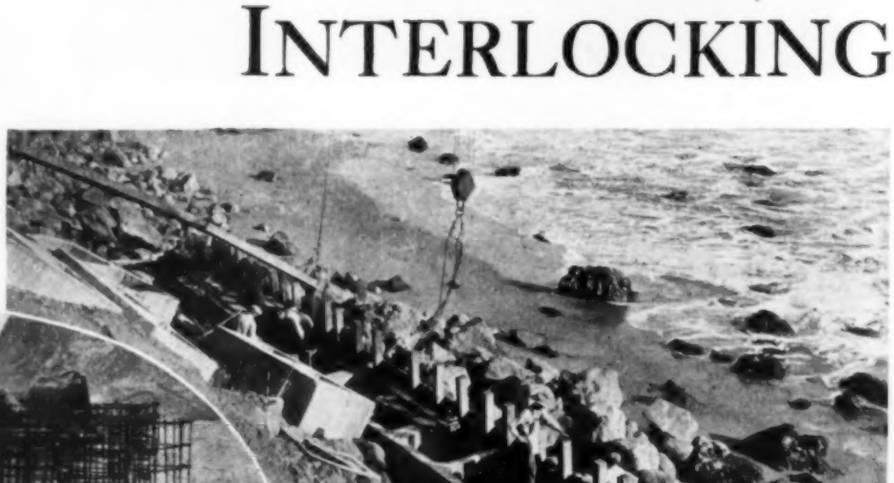
INTERLOCKING

WITH waves constantly breaking over the site of the work, precast concrete cells without bottoms proved to be a desirable substitute for ordinary wood forms in the construction of a seawall to protect a new state road built by the California Division of Highways along the Pacific Ocean in Ventura County. With the aid of a stiff-leg derrick the cell units, curved at the ends to provide an interlock, were placed in a row at the foot of a rocky slope and, when filled with concrete, served as a toe-wall to support slope paving subsequently laid.

The cells are rectangular, 5x10 ft. in plan and 3 ft. high, of reinforced concrete 6 in. thick, and weigh about 3 tons. The size was determined as about the maximum for convenient handling with a stiff-leg derrick. They were cast on the highway right-of-way close to the seawall site, using a portable concreting plant which was moved as the work progressed. Removable forms, built of ordinary tongue-and-groove flooring and well oiled, served for at least 20 pours of concrete.

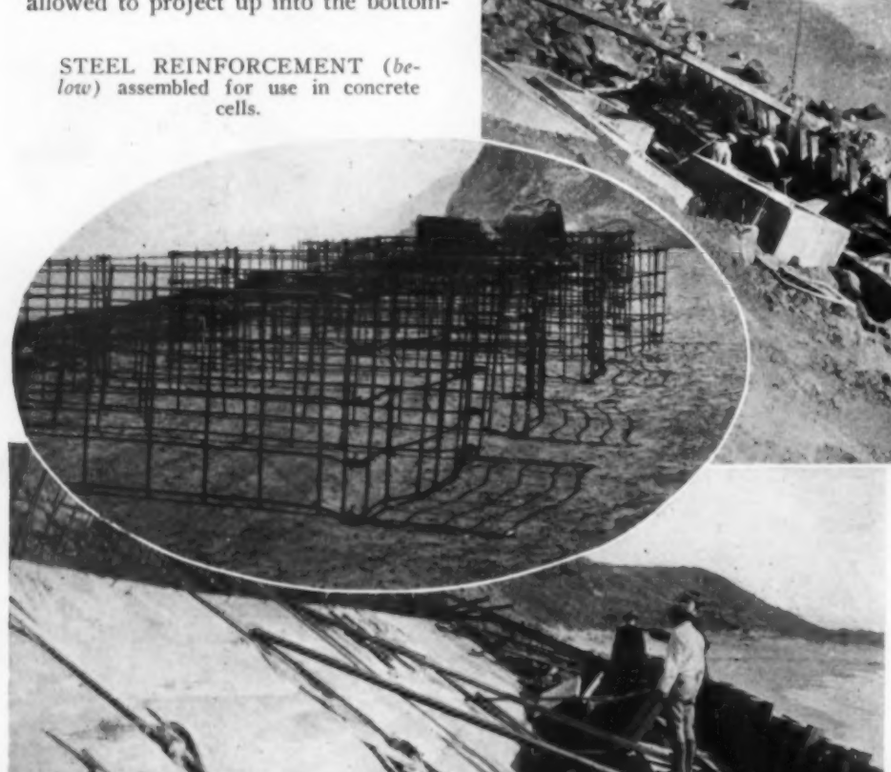
In preparation for placing the cells small boulders were cleared away by hand or with the aid of a derrick. Whenever possible, large boulders were allowed to project up into the bottom-

WAVES DRENCHED WORKERS as they prepared rocky base to seat precast cell units in row.



CELLS IN PLACE ready for filling with concrete while tide is out. Timber posts are embedded in concrete to carry plank parapet wall to protect from the waves men working on slope paving.

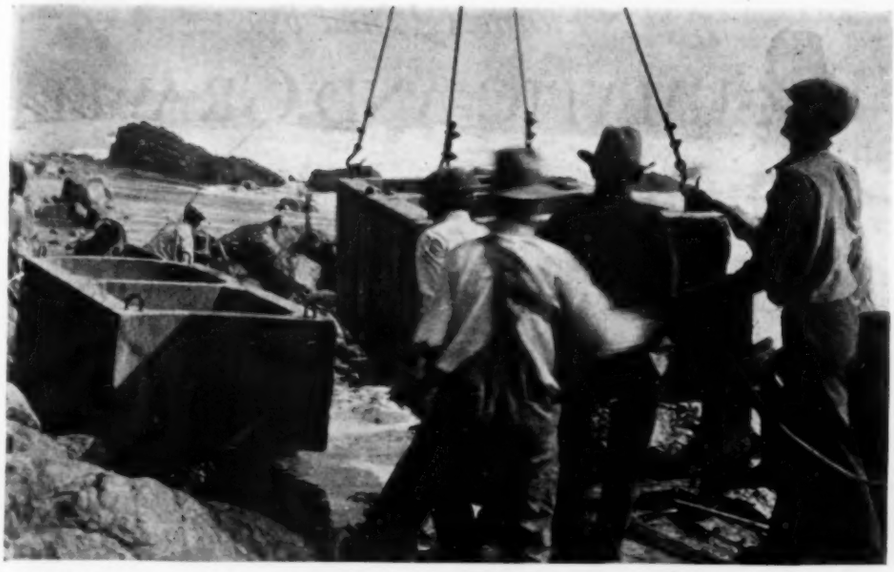
STEEL REINFORCEMENT (*below*) assembled for use in concrete cells.



ROW OF CELLS completed and filled to serve as toe-wall for paved slope. Plank-wave protection in place.

less cells or such rocks were moved into position by the derrick to help consolidate the concrete filling with the natural rock of the shore.

In most of the locations it was possible to get a stiff-leg derrick into position on the highway so that a 70-ft. boom could swing the precast cells from their position on the roadway into place in the seawall. This derrick was built so that motive power could be supplied by a power shovel. For this service the shovel moved in underneath the derrick frame and cables



EACH CELL UNIT, weighing 3 tons, is lowered to place by stiff-leg derrick at top of slope.

Bottomless Cells Serve as

PRECAST FORMS

FORMS FOR CELLS assembled ready for pouring. They are built of ordinary tongue-and-groove flooring, oiled, and last for 20 pours.

were passed around the bull-wheel and through the sheave. The derrick was moved by taking the railroad iron weights off the legs and using the same shovel employed in its operation to move it along the roadway. A wheel built into the derrick frame under each leg made it possible to do this with the shovel itself supporting only the portion of the derrick weight that centered at the mast.

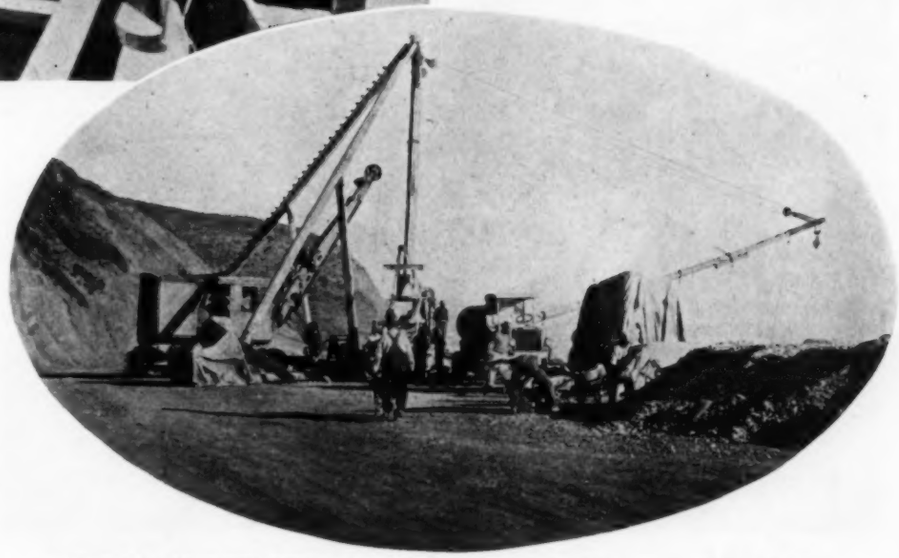
After the cells were in place they were filled with rubble concrete. Immediately before filling a row of 6x6-in. timber uprights was placed in the cells along the offshore wall to be embedded in the concrete. After the concrete had set, a 3-ft. plank parapet was built on these posts to protect workmen on the toe-wall and slope paving from the waves. The planks were later removed and the posts cut off.

Where tide levels permitted concrete also was placed beneath and in front of the cells, filling in between the boulders, more thoroughly to consolidate and to strengthen the wall. This work was done down to the low-tide level during quiet periods when the tide was out.

Unit Costs

The cost of preparing the foundation, building the precast cells and filling them with concrete, has averaged about $18 per linear foot. The cost of the shore protection complete, including a 20-ft. height of paving (measured on the slope) behind the cells averages from $25 to $30 per front foot. Based on these costs, it was estimated that if the work remained in place only through one winter, it would save more than the road reconstruction costs that otherwise would have been necessary. At the end of the first winter season just past the shore protection is reported by the state highway engineers to have withstood wave action, including one rather severe storm, without sign of damage to or weakness in the protecting units.

The work has been done by crews employed by the State Highway Commission in charge of M. L. Sullivan, superintendent, working under the general supervision of S. V. Cortelyou, division engineer of Los Angeles. C. H. Purcell is California state highway engineer.



STIFF-LEG DERRICK, with 70-ft. boom, operated by power from Northwest shovel, lifts cells from casting yard and lowers them to place.

Tunnels Lined by

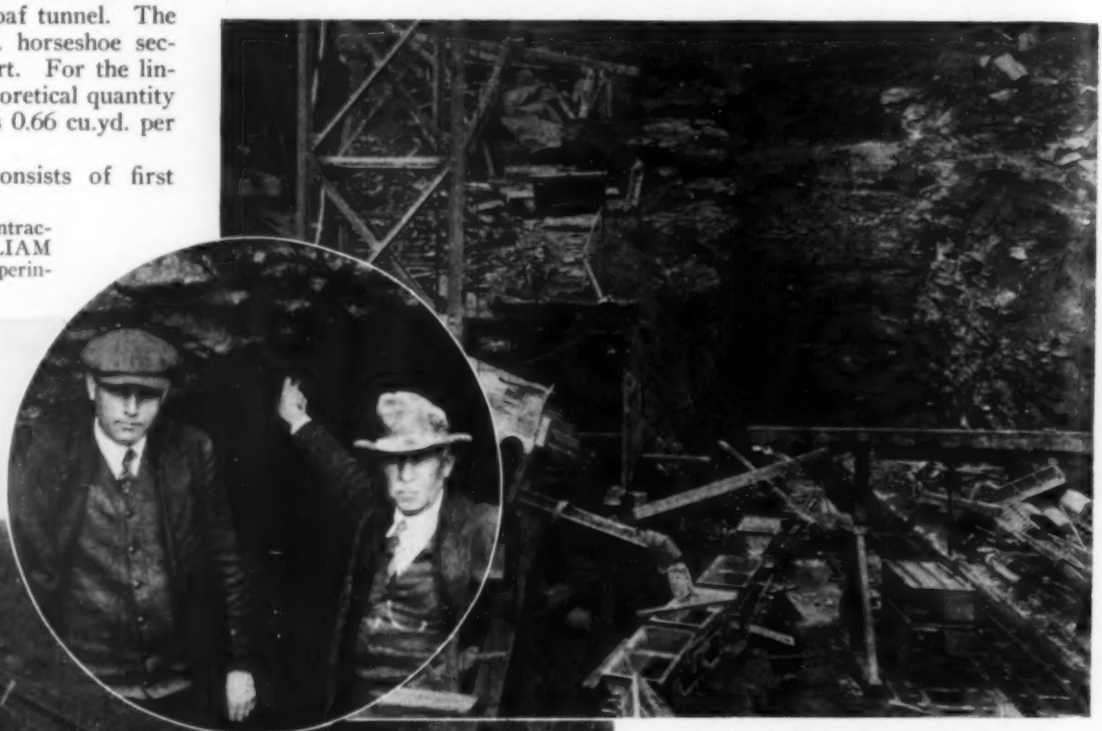
PNEUMATIC AND GRAVITY

Concrete-Placing Machines

IN LINING the Gulph and Sugar Loaf tunnels of the North Branford development of the New Haven (Conn.) Water Co., C. W. Blakeslee & Sons, Inc., New Haven, the contractor, is making use of three concrete plants: one at the north portal of the Gulph tunnel, one between the two tunnels and a third at the east portal of the Sugar Loaf tunnel. The tunnels are of 8x8-ft. horseshoe section, with curved invert. For the lining, 8 in. thick, the theoretical quantity of concrete required is 0.66 cu.yd. per linear foot.

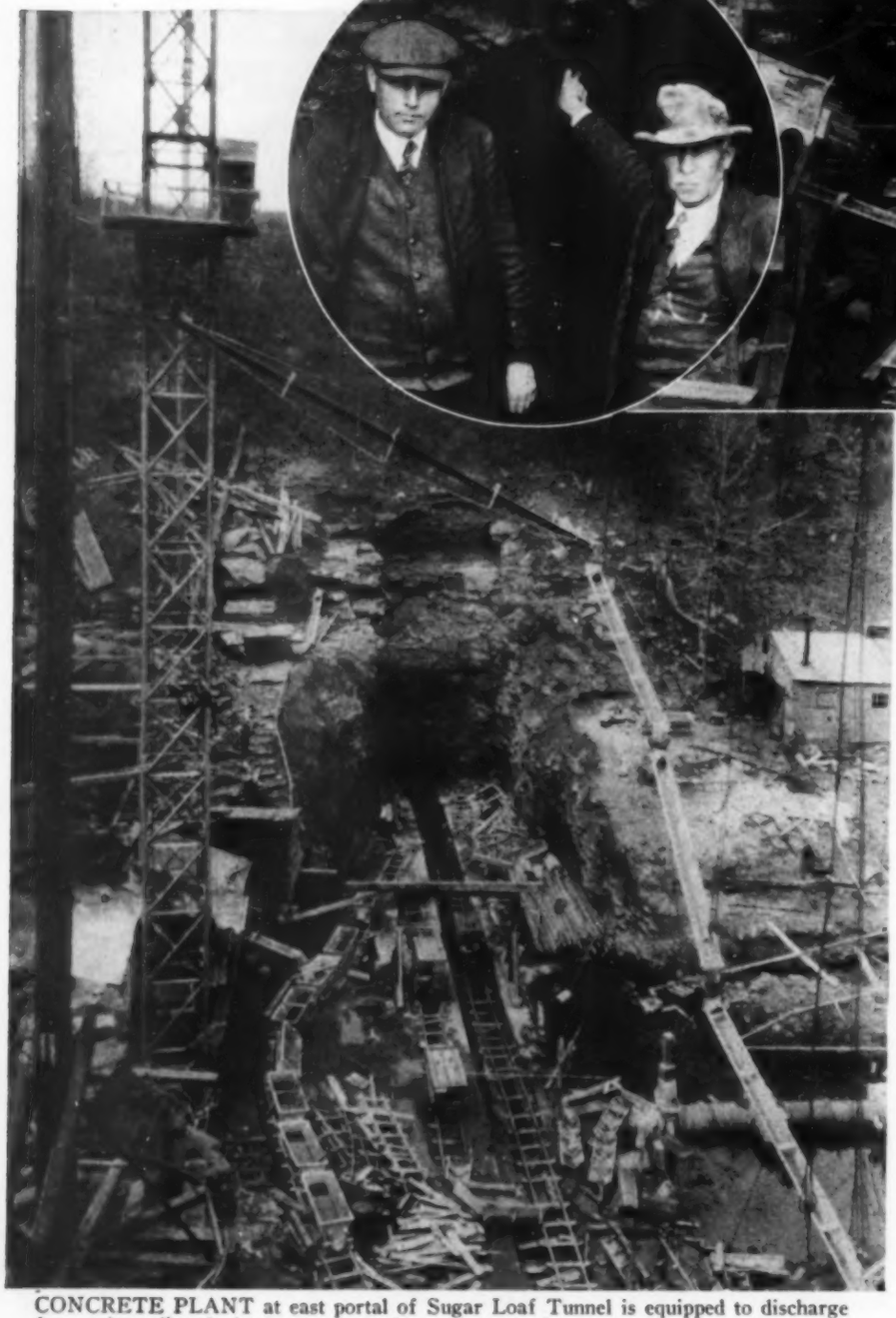
Lining procedure consists of first pouring the invert for the full length of the tunnel section and then completing the arches and sidewalls with pneumatic concrete-placing equipment. Concrete is delivered by trains of Atlas storage battery locomotives and eight ¾-yd. roll-over dump cars. These trains operate on 24-in. gage track elevated on wood horses or sidewall brackets during the invert concreting. The tracks are later transferred to the finished invert while the remainder of the tunnel lining is being placed.

The contractor developed a practical form system for the sidewalls. Adjustable hangers are suspended from steel bars seated in the rock walls or from wooden brackets, if in a timbered section of tunnel. The hangers, placed 10 ft. apart, hold 6-in. channels 10 ft. long which form the mold-board of the haunch wall. The joints between sections of channel are formed by plates about 10 in. long which are hinged to the flanges of one channel and are fastened to the other by a pin which



DUMP CARS (*above*), 33 in. wide, were specially designed to deliver concrete into hoppers of pneumatic concrete-placing machine and to give 2-in. clearance when passing on switch tracks inside narrow tunnels. At right is trolley block and chain by which locomotive storage batteries are handled for charging.

S. P. SEARS *(left)* contractor's engineer, and WILLIAM H. RYAN, general superintendent.



CONCRETE PLANT at east portal of Sugar Loaf Tunnel is equipped to discharge from mixer directly into cars or to elevate concrete in a tower serving a dam to be constructed nearby.

drops through holes in the flanges and through the looped end of the plate.

In concreting the arch walls a Ransome 14-cu.ft. pneumatic placing machine forces the concrete behind Blaw-Knox collapsible steel arch forms. Five 20-ft. sections of these forms are joined together to make a solid 100-ft. arch form. Forms are left in place 8 hours after pouring. They are struck and reset in about 5 hours, enabling the contractor to concrete 100 ft. of arch a day.

Because of the limited space available for dumping concrete into the hopper of the pneumatic concrete-placing machine, a special size of Atlas roll-over dump car had to be built for this operation. These cars have a 7 ft. 6-in. body and a 9-ft. overall length, including the bumpers. Their capacity is 18 cu.ft., and the clearance width is 33 in. In dumping position on the carriage of the pneumatic concrete machine they extend 1 ft. 4½ in. beyond the center line of the tunnel.

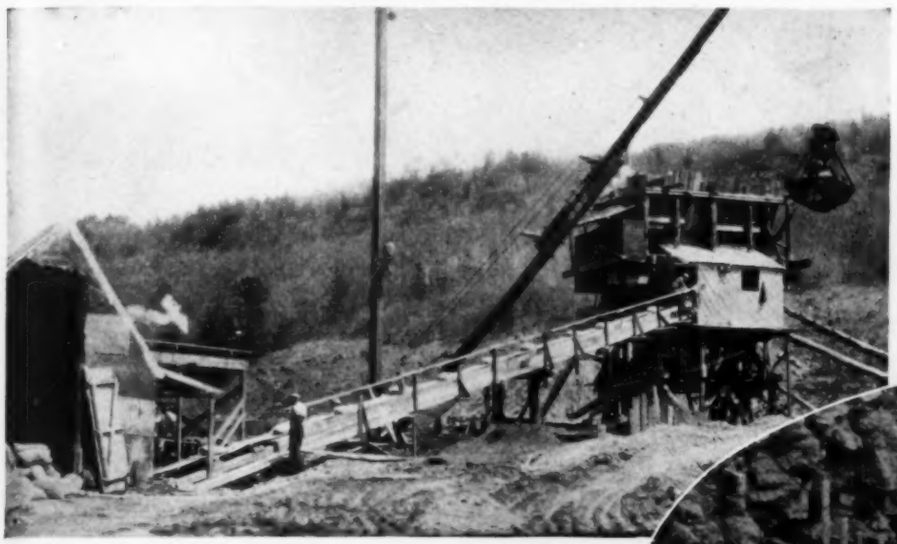
A movable switch and passing track unit, resting on top of the rails of the 24-in. gage main track, is kept close to the pneumatic concrete placing machine. An air hoist mounted in the first section of the forms pulls the loaded cars up the incline to the track beside the hopper.

On the 5,100-ft. section at the west end of the Sugar Loaf tunnel the average rate of concreting the invert was about 370 lin.ft. a day. This length of invert requires about 150 yd. of concrete.

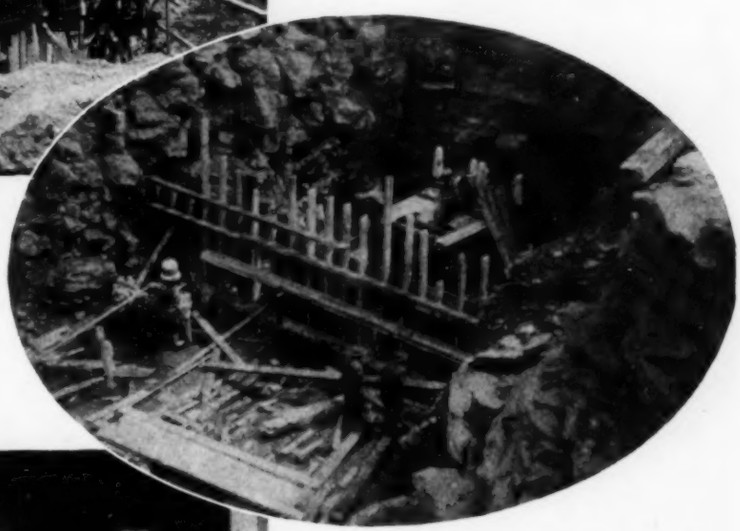
Of the three plants used in concreting the tunnels the most efficient, partly because of its favorable location, is at the east end of the Sugar Loaf tunnel. Trucks haul in materials to the top of the steep slope which forms tne east side of the valley. Sand and rock are dumped directly from trucks into bins which discharge 40 ft. below upon belt conveyors. These conveyors, 90 ft. in length, carry the aggregates to the bins above a 1-yd. Ransome mixer.

Cement is unloaded from trucks into a shed at the top of a broad covered chute which leads to the upper end of a third belt conveyor. This conveyor takes the sacks of cement, under cover to the mixer platform. After the sacks have been emptied, they are tossed upon a lower covered platform, where they finally are shaken mechanically and are baled.

The concrete plant at the west portal of the Sugar Loaf tunnel already has produced concrete for lining 5,100 ft. inside the tunnel and 400 ft. of arch outside. In addition, it is to furnish concrete for 100 ft. inside the south portal of the Gulph tunnel and 200 ft. outside. The total quantity of concrete will approximate 10,000 cu.yd. The situation of this plant is less favorable, and materials here are stockpiled and lifted to the bins above the mixer by means of a derrick and clamshell bucket. The mixer is a 1-yd. Koehring machine.



GUY DERRICK, with clamshell bucket, and belt conveyor driven by a steam swinging engine elevate materials to concrete plant at north portal of the Gulph Tunnel.



CONSTRUCTING FORMS around control gates at siphon tunnel heading.

THE ANSWER to the tunnel crew's query: "When do we eat?"

Only 1,600 ft. at the north end of the Gulph Tunnel, where the bore passes through sandstone, is being lined. The ¾-yd. Koehring mixer in the concrete plant at the north portal is mixing the concrete for this lining. A guy derrick handling a ½-yd. clamshell bucket keeps the bins above the mixer filled and a belt conveyor driven by the swinging engine of a hoist carries cement up a steep grade to the mixer platform.

C. W. Blakeslee & Sons, Inc., in lining the tunnels and constructing some small dams, is completing its contracts for a $3,000,000 project to increase the water supply of New Haven. William H. Ryan is general superintendent and S. P. Sears engineer for the contractor. A. B. Hill is consulting engineer, and C. M. Blair is engineer-in-charge for the New Haven Water Company, of which E. E. Minor is general manager.

JOB ODDITIES

A Page of Unusual Engineering and Construction Features

THE VORTEX. Flood waters, carrying 12-ft. plank, enter arch intake of Saluda dam in South Carolina. Vortex is 8 ft. in diameter and 22 ft. long.

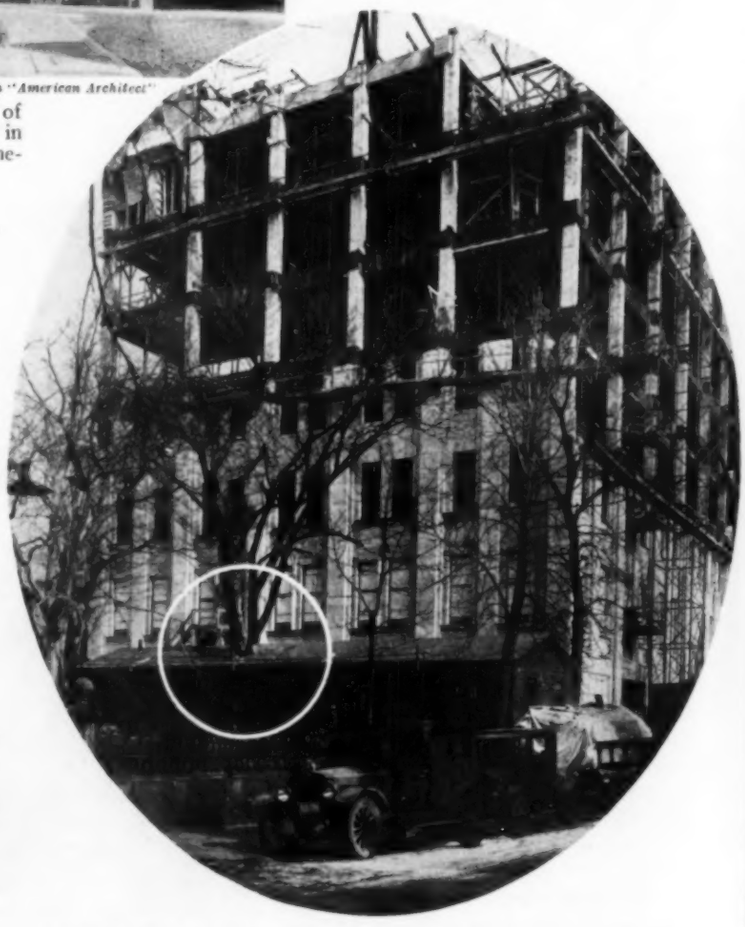
Photo from "American Architect"

AN OLD TIMER in the crane family. This unusual rig of the full-revolving type, completely enclosed, occupies a site in the public square of Luneburg, Germany.

HAS YOUR job developed anything odd? The editor would like a snapshot of it.

©P & A

FLIES FLAG to halt road builders. John Dreyer, of Newark, N. J., attempts to block passage of new highway through his property on Stuyvesant Ave.



CONTRACTOR, SPARE THAT TREE! Morton C. Tuttle Co., of Boston, found it more economical to build field office around tree that had to be preserved at Worcester, Mass., than to construct two separate shacks, with consequent loss of space.

Present and Accounted For —

A Page of Personalities

COL. HUGH L. COOPER, consulting engineer, New York City, who has been retained by the Russian Soviet Government to plan a $100,000,000 hydro-electric power development in the Ukraine.

LOUIS YAGER, assistant chief engineer, Northern Pacific Railway, St. Paul, Minn., who has been elected president of the American Railway Engineering Association.

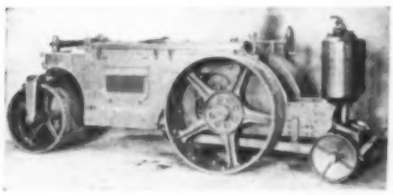
FRANK W. HANNA, newly appointed chief engineer of the East Bay Municipal Utility District, Oakland, Calif., succeeding Arthur P. Davis, resigned to become consulting engineer on irrigation to the Russian Government.

C. H. BUCKIUS, promoted from division engineer to be construction engineer of the Pennsylvania State Highway Department on its comprehensive program authorized by recently enacted legislation.

NEW EQUIPMENT ON THE JOB

Self-Powered Roller

The Austin Manufacturing Co., of Chicago, has rounded out its line of light rollers with the production of the Cadet which differs from the others in not obtaining its power from a tractor. It is built in 5, 6 and 7-ton sizes



and can be fitted with a patented front planing blade and a pneumatic scarifier.

The Cadet is powered by a heavy-duty 4-cylinder Buda motor which provides ample power not only for rolling but also for leveling rough grades and scarifying. The motor can be cranked from either side.

The compression of the rear rolls of the machine, without planer or scarifier attachment, is 194 lb. per linear inch on the 5-ton size, 242 lb. on the 6-ton size and 303 lb. on the 7-ton size.

Pull-Type One-Man Grader

The fact that it is easier to pull a machine out of the mud than to push it out was taken into consideration when the Foote Bros. Gear & Machine Co., of Chicago, designed its latest pull-

type, one-man grader, the Stockland Whippet. This grader is built to carry its own load without hampering the tractor and can be pulled wherever it is possible for a tractor to go.

The Whippet is equipped with a balanced blade hung in the proper position to steady and hold the upper structure firm. Four wheels, elevating the lift frame and making a curved frame unnecessary, take the weight off the tractor and eliminate any downward pull. The tractor is easily detached from the grader by the release of a drawbar pin connecting the two machines.

These graders may be purchased in three sizes: No. 0-10-12 hp.; No. 1-10-15 hp., and No. 2-15-20 hp.

For Welding Bell and Spigot Joints

A closing press for welding bell and spigot joints on steel pipe quickly and cheaply in shop or field has been perfected by Frank H. Smith of Philadelphia and H. A. Stringfellow of St. Joseph, Mo.

This machine is a hydraulic press of six cylinders split and hinged so that it works somewhat like a clamshell bucket. Each cylinder is capable of generating 80 tons pressure. The re-

sult is a press weighing less than 1,500 lb. that will develop almost a million pounds pressure on the joint.

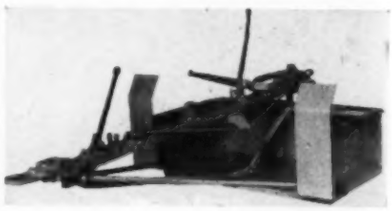
In using this method the spigot is entered into the bell, the machine, swung from the boom of a tractor crane with one cable, is placed around the pipe and the pressure pumped by hand. The shoes of the press close around the bell of the pipe and press it down on the spigot, producing a rigid contact. After the press is removed, a single weld is laid around the edge of the bell, welding it to the spigot.

One machine will take three sizes of pipe simply by changing the die shoes.

Pipe with joints so constructed have withstood a test pressure of 1,000 lb. per square inch. A 34-per cent saving in cost and a 42-per cent increase in speed in laying of pipe have been shown in tests of the machine.

Automatic Tractor Scraper

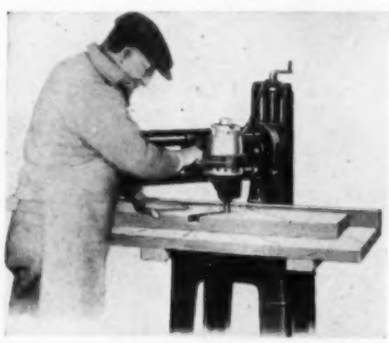
A line of hand and hydraulically-operated automatic tractor scrapers, ranging from 1 to 4 yd. in capacity, has recently been announced by the manufacturing division of the Slate



Construction Co., Albany, Ore. The outstanding features of the machines, as claimed by the manufacturers, are sturdy construction, interchangeable parts, body parts both riveted and welded together and one-man operation.

A Versatile Saw

Of interest to carpenters, builders, lumber yards and woodworkers in general is a new type of portable saw recently perfected by J. D. Wallace & Co., Chicago. This machine, called the Workace radial saw, derives power from the ordinary lighting or power circuit and is equipped with a

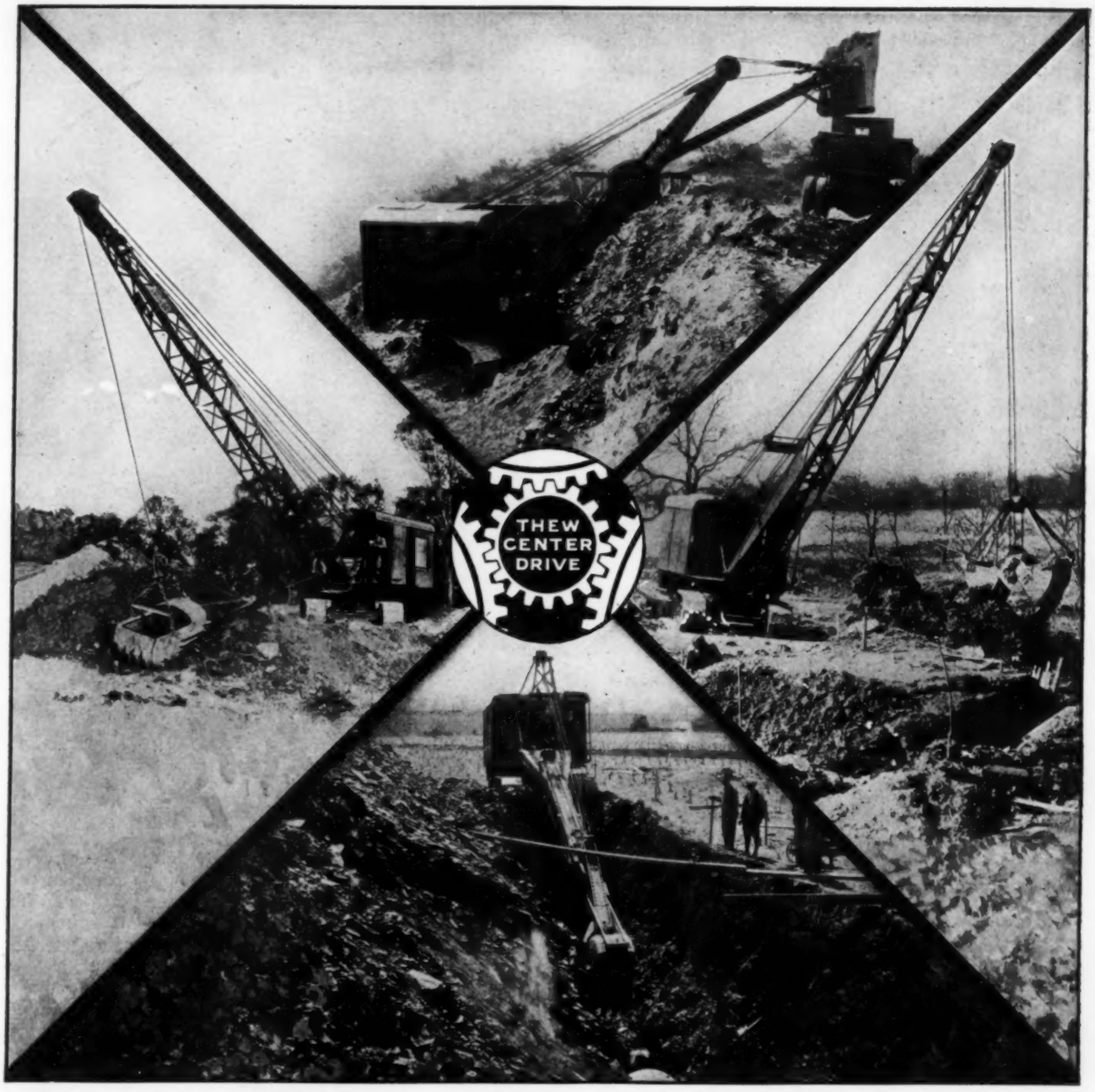


General Electric motor built in and directly connected.

The saw and motor unit are mounted on a turntable 6 in. in diameter which, in turn, is mounted on two heavy steel rods placed 5-in. apart to prevent any spring.

The radial arm is mounted in the pedestal on a turntable 10 in. in diameter, permitting the arm to be set in any position. The pedestal is also mounted on a turntable, 10 in. in diameter.

With an 8-in. blade it cuts 2½ in. deep, and with a 9-in. blade 3-in. It travels 19½ in. in the arm and is adjustable vertically 5¾ in.



One Basic Design

LORAIN-75 1¼ yd. units are all built to the same basic Center Drive design. Shovel, crane, dragline or backdigger booms are interchangeable. You can change over at any time to the most efficient machine for the particular kind of work. In the purchase of one type of machine you get the benefit of mass production of the basic unit itself. The same principle of volume manufacture is applied to the Lorain-55 and 60, 1 yd. units.

THE THEW SHOVEL COMPANY · *Lorain, Ohio*

THEW LORAIN 55-60-75

Don't Miss the many profitable short cuts a *Buster* will give you

Sullivan Vibrationless Compressor and Sullivan Busters removing concrete for a street railway in Mobile, Alabama

Let Us Demonstrate a *Buster* On any of These Jobs

You may already have seen the new Busters removing concrete. The "K-2" for general service, and the "K-4" for smashing the hardest reinforced concrete, are already popular.

But are you familiar with the many other ways contractors are earning money with Busters?

Recently a trench for gas pipe had to be dug through a factory yard. The ground was dressed down with seven inches of steel filings and cast iron chips. Hand picks couldn't make a dent—but Busters dug the trench, with ease.

Busters are used to excavate hardpan, shale, and frozen ground; and for shallow rock drilling, where the amount of work does not require a regular rock drill. Backfill tamping in trenches is another job you can do with Busters.

When an old factory was torn down—Busters knocked out the retaining walls, demolished the concrete foundations, cut out the reinforcing bars, and tore up 3-in. spruce timber flooring.

Channels for plumbing were made in the foundations of a new building, with Busters.

Sheet pile driving is another favorite job for Busters. The operator can stand on anything and the piling is not split in driving.

The low cost of a Buster, and the many ways the average contractor can earn profits with it—make the Buster a splendid investment.

If you have a job you think a Buster can do—call the nearest Sullivan Distributor. He will be glad to demonstrate on your job. *Use the coupon for further information.*

SULLIVAN

SULLIVAN MACHINERY COMPANY

404 N. MICHIGAN AVE.

Chicago

Offices in New York, Boston, Pittsburgh, Denver, Knoxville, Cleveland, Salt Lake, Duluth, San Francisco, Spokane, Dallas, Joplin, El Paso, and other principal cities

Use This Coupon

I am interested in making more money with Busters. Send me booklet and name of distributor who will demonstrate Busters on my job.

Name .....

.....

Address .....

.....

"Fill'er up! —the Monarch'll snake'er out"

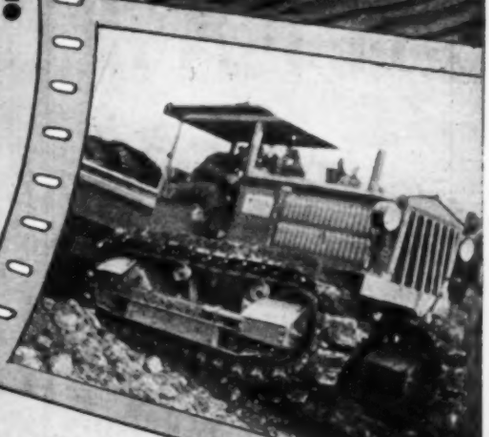
ALLIS-CHALMERS A-C MILWAUKEE

..and out she comes!

When a Monarch-operating contractor tells the shovel man to fill an 8-yard crawler wagon, he *knows* the Allis-Chalmers-Monarch will pull it *anywhere!*

Heavy loads and soft footing mean nothing to the Monarch, on any contractor's job. The Monarch scrambles over big rocks, ploughs through deep mud and dust, eases itself up high banks and into deep fills with as little effort as a duck paddling around on a pond. Hook on any load—you can't stump Monarch strength and power!

Contractors should investigate all the distinctive features of the Allis-Chalmers-Monarch. It is built by an organization that has over 80 years' experience in building power machinery—*and that means something!* Write for literature and prices.



ALLIS-CHALMERS MANUFACTURING CO.
Specialists in Power Machinery Since 1846
MONARCH TRACTORS DIVISION SPRINGFIELD, ILL.

Allis-Chalmers
Monarch Tractors

The Complete Line of Truscon STEEL BUILDING PRODUCTS

Saves in More Ways

Superior Quality
Economical Price
Low Cost of Installation
Reduced Handling Charges
Less Expense for Freight
Certainty of Delivery

TRUSCON STEEL BUILDING PRODUCTS

STEEL WINDOWS
STEEL DOORS
ROOFDECKS
METAL LATH
STEEL JOISTS
REINFORCING STEEL
ROAD REINFORCEMENT
ENGINEERING SERVICE

Contractors more and more are learning the advantages of securing all their Steel Building Products from one source. In selecting Truscon, they are assured of superior quality of the products and the backing of large resources, extensive manufacturing facilities, engineering service and local warehouse delivery.

Buildings need no longer be held up pending the arrival of some material. Everything required is right on the job when you want it. One shipment covers all; no separate items of expense for handling different products. Buildings are completed in quicker time with less labor and at lower cost when Truscon Steel Buildings are used throughout.

Write for quotations and full information

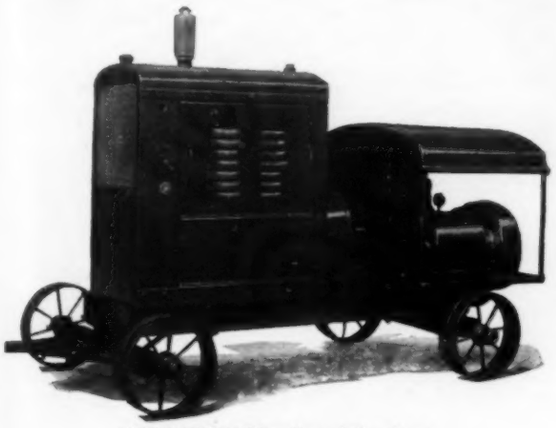
TRUSCON STEEL COMPANY
YOUNGSTOWN, OHIO

Trussed Concrete Steel Company of Canada, Limited,
Walkerville, Ont.

Warehouses and Offices in Principal Cities

TRUSCON

"FIRST Time in Our History"



NOVO TRIPLEX—One of the three types of Novo Road Pumps

no charge against pumping delay

''Used Novo Triplex Road Pump on five miles of road pumping—four miles through two inch pipe line—ran pump at 200 r.p.m.—had no trouble supplying 27-E paver, one small mixer and two sprinklers—averaged about 250 cubic yards concrete per day—worked against 75 foot head—did not cause one minute delay—FIRST TIME IN HISTORY DID NOT HAVE TO CHARGE A LOSS AGAINST PUMPING DELAY.''

COLLINS BROTHERS

Flud Oild

Novo Flud Oild lubrication positively floods every moving pump part with oil. Yet there is no complicated oil pump—nothing to get out of order—no pipes to clog.

Constant Pressure

The new Novo Water Governor does what other relief valves cannot. It holds line pressure steady—keeps back pressure from the pump—and permits the engine to idle when no water is being used. There's a 15 to 25% saving in gasoline and wear and tear.

Good-bye Water Hammer

Novo Road Pumps run at 200 r. p. m. instead of the customary 65. Such high speed operation provides steadier flow without the usual piston pulsations—water hammer is ended—and line pressure is held steadier.

RECORDS like this are not a matter of luck. They are due to the outstanding lead Novo has over the field in design and construction.

The high speed operation—the "Flud Oild" lubrication—the Novo Water Governor are three of these advantages. The Novo Pumping Handbook gives many more.

If you've got a water handling problem that calls for a better-than-ordinary pump—if you are interested in cutting your water pumping costs on all jobs—send for your copy of the Handbook today.

NOVO ENGINE COMPANY, 214 Porter Street, Lansing, Michigan

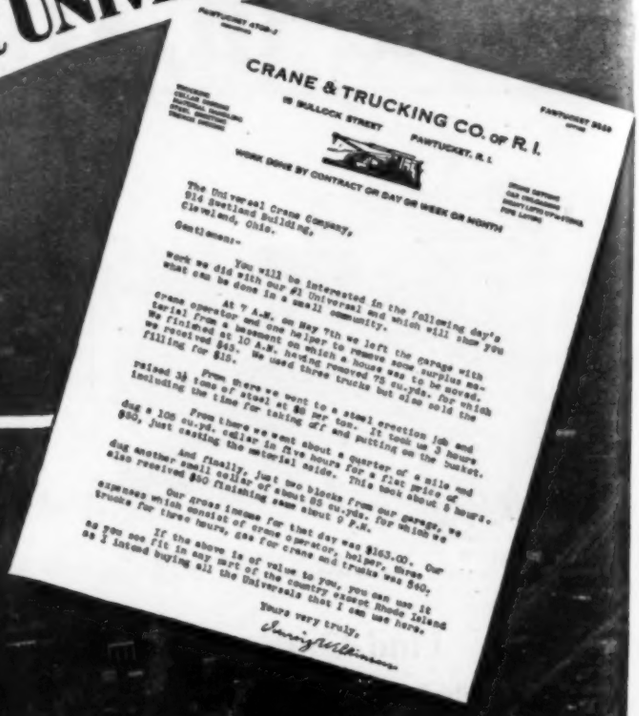
Clarence E. Bement, Vice-Pres. & Gen. Mgr.

NOVO

PUMPS — ENGINES — HOISTS

Service, parts and sales in over 70 cities

WHAT A DAY IN THE AIR would show you about UNIVERSALS


CRANE & TRUCKING CO. OF R. I.
15 BULLOCK STREET
PAWTUCKET, R. I.

The Universal Crane Company,
Old Overland Building,
Cleveland, Ohio.

Gentlemen:-

You will be interested in the following day's work we did with our #1 Universal and which will show you what can be done in a small community.

At 7 A.M. on May 7th we left the garage with crane operator and one helper to remove some surplus earth from a basement on which a house was to be moved. We finished at 10 A.M. hauling and removed 72 cu.yds. for which we received $45. We used three trucks but also sold the filling for $15.

From there we went to a steel erection job and raised 34 tons of steel at $5 per ton. It took us 3 hours including the time for taking off and putting on the bucket.

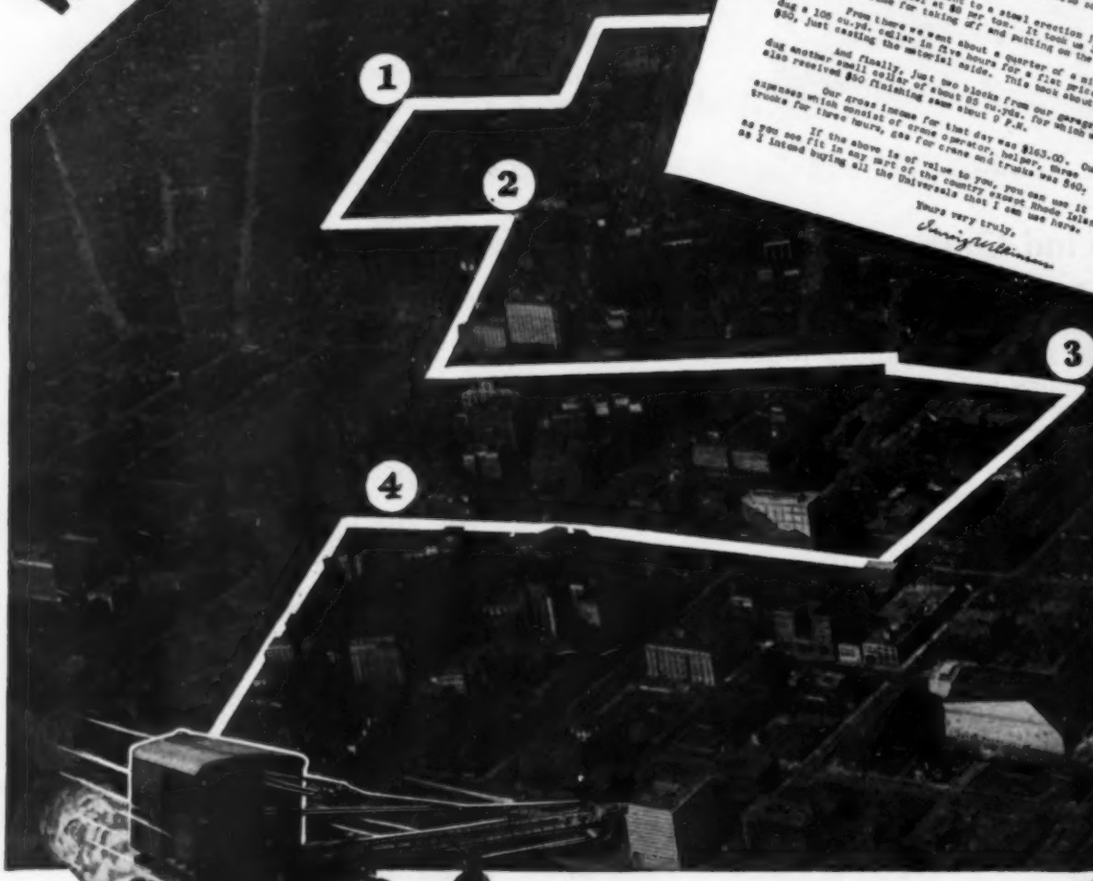
From there we went about a quarter of a mile and dug a 106 cu.yd. cellar in five hours for a flat price of $90, just casting the material aside. This took about 8 hours.

And finally, just two blocks from our garage, we dug another small cellar of about 65 cu.yds. for which we also received $60 finishing some time after 6 P.M.

Our gross income for that day was $163.00. Our expenses which consist of crane operator, helper, three trucks for three hours, gas for crane and trucks was $60.

If the above is of value to you, you can use it as you see fit in any part of the country except Rhode Island as I intend buying all the Universals that I can use here.

Yours very truly,



Write for additional proof of Universal's money making features. Ask for Bulletin 36.

Also builders of the **UNIVERSAL 35**

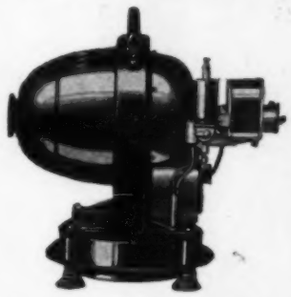
mounted on the Center Drive Crawler

THE UNIVERSAL CRANE COMPANY · *Lorain, Ohio*

UNIVERSAL

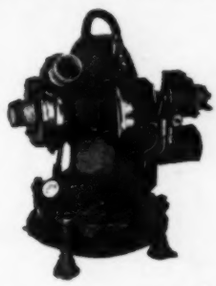
HOMELITE PRIMING CONSTRUCTION HELPERS ALL STAR CAST

HOMELITE 110-VOLT GENERATOR



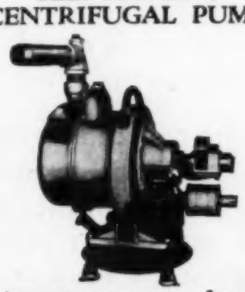
Measures 21" x 21" x 14". Weighs 110 lbs. with built-in Homelite air-cooled gasoline engine.

HOMELITE CENTRIFUGAL PUMP



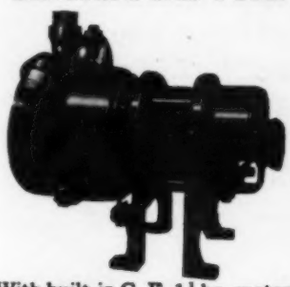
Weighs 95 lbs. with built-in Homelite air-cooled gasoline engine. Capacity up to 7500 gallons per hour.

HOMELITE SELF-PRIMING CENTRIFUGAL PUMP



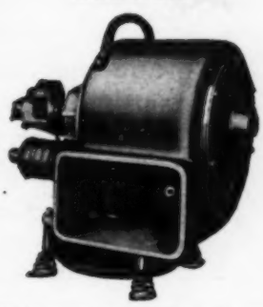
A two-purpose pump—for volume and seepage. No foot valve needed. Weighs less than a 100 lbs. with built-in Homelite air-cooled gasoline engine. Capacity up to 6000 gal. per hr.

HOMELITE SELF-PRIMING ELECTRIC CENTRIFUGAL PUMP



With built-in G. E. 1½ hp. motor, 110 or 220 volts, A.C., 60 cycle, single phase, 110, 220 or 550 volts, three phase. Weighs 135 lbs. Capacity up to 6000 gal. per hr.

HOMELITE BLOWER



Weighs 70 lbs. with built-in Homelite air-cooled gasoline engine. Capacity up to 2000 cu.ft. of air per minute.

ALL PORTABLE BY ONE MAN—BUILT-IN HOMELITE AIR-COOLED GASOLINE ENGINE

HOMELITE CORPORATION

75 RIVERDALE AVE., PORTCHESTER, N. Y.

2951

Champion Hi-Speed Belting

Champion Hi-Speed Belting has strength—flexibility and long life. Special construction and special materials have resulted in a belting for difficult work such as only a real champion can do.

Ask for a sample of

CHAMPION HI-SPEED
The Super Service Belt

IF you first inquire into the actual service records of all brands of mechanical rubber goods you will eventually buy Republic. But it is only fair to mention that Republic's success in placing high grade merchandise on the market at competitive prices has been partly due to efficient distributor handling. And since an Industrial Supply Distributor can serve a consumer even more effectively in keeping down costs, it is suggested you use every facility he offers. Ask your distributor about Republic rubber.

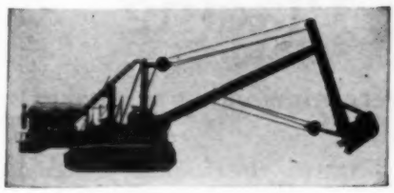
THE REPUBLIC RUBBER CO.
Youngstown, Ohio

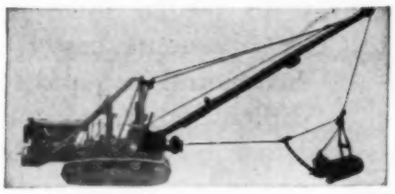
Belting - Packing - Hose
Molded Goods - Lathe Cut Goods

REPUBLIC means the Best Mechanical Rubber Goods

INTERCHANGEABILITY

In a Hurry





For Lower Costs

Costs go up when equipment stands idle. Costs go down when production goes right on. This machine shows low costs because it can be changed over in a hurry. It enables you to handle a wide variety of jobs with a single machine, and lower investment. It is not only dependable and economical in operation but the first cost is low, due to volume production and specialization. You'll find it to your advantage to get the facts before you buy additional equipment for material handling and excavating.

Write Today

New literature is now available, with complete specifications, operating data and information concerning the changeovers to crane, clamshell, trench hoe, dragline and backfiller.

UNIVERSAL POWER SHOVEL CO.

Division of Unit Corporation of America

15841 SECOND BOULEVARD
Detroit, Michigan

New Concrete Floor Ready to Use 10 to 15 Hours After Placing

RECENTLY it became necessary to replace the floor of the Armour Packing Company's loading dock at Kansas City. This dock is in constant use; it was impossible to close it while the new floor was being placed.

By using "INCOR" Brand Perfected High-Early-Strength Portland Cement, the new concrete floor was completed without the loss of a single day.

The floor, 746 feet long and 40 feet wide, was built in 100-foot sections made of "INCOR" concrete. The sections attained service strength *10 to 15 hours after placing* and were immediately opened to heavy loading traffic.

"INCOR" Brand Perfected High-Early-Strength Portland Cement contains no admixtures; requires no special methods of handling. "INCOR" prevents costly construction delays and solves difficult engineering problems, because "INCOR" produces *permanent dependable Portland Cement* concrete that is ready to use in 24 hours. Whenever time is an important factor in a construction job, it pays to use "INCOR"!

INTERNATIONAL SYSTEM
LONE STAR CEMENT
A PERFECTED HIGH-EARLY-STRENGTH "INCOR" PORTLAND CEMENT

Outstanding quality and a policy of fair business dealing have earned nation-wide recognition for LONE STAR Cement. Now, to meet the need for dependable 24-hour concrete, the makers of LONE STAR also offer "INCOR" Brand.

INTERNATIONAL CEMENT CORPORATION

342 Madison Avenue, New York

One of the world's largest cement producers—13 mills...total annual capacity 21,000,000 barrels

SUBSIDIARIES

LONE STAR CEMENT COMPANY ALABAMA, Birmingham, Alabama
LONE STAR CEMENT CO. INDIANA, Inc., Indianapolis, Indiana
THE CUBAN PORTLAND CEMENT CORP., Havana, Cuba
LONE STAR CEMENT CO. PENNSYLVANIA, Philadelphia, Pennsylvania
THE LONE STAR CEMENT CO. (KANSAS), Kansas City
LONE STAR CEMENT CO. VIRGINIA, Inc., Norfolk, Virginia
LONE STAR CEMENT CO. NEW YORK, Inc., Albany, New York
LONE STAR CEMENT CO. LOUISIANA, New Orleans, Louisiana
ARGENTINE PORTLAND CEMENT CO., Buenos Aires, Argentina
LONE STAR CEMENT COMPANY TEXAS, Dallas and Houston, Texas
URUGUAY PORTLAND CEMENT COMPANY, Montevideo, Uruguay

It's the *Super-Charger* of the *Thor* SIX AIR COMPRESSOR *That Gives You More Air*

The THOR Creates a New Standard of Compressor Efficiency and Performance

In buying a Compressor, the most important feature to you is the amount of "air delivered." For it is NOT THE "CAPACITY" or "RATING" of a Compressor that interests you BUT THE AMOUNT OF AIR "ACTUALLY DELIVERED." "Capacity" or "rating" merely indicates the size of a Compressor and NOT the amount of air it delivers.

Because of clearance loss, valve slippage, etc., no Compressor EVER DELIVERS AN AMOUNT OF FREE AIR EQUAL TO ITS DISPLACEMENT. *And this is why the THOR SIX has a Super-Charger.* The Super-Charger was invented to counteract these losses. It is an exclusive patented feature that enables the piston on its IDLE or downward stroke to compress the additional air necessary to make up for the usual losses in single acting Compressors.

You not only get more air with a THOR but you also get a Compressor that is designed along modern engineering principles. The THOR is direct driven, both engine and Compressor being mounted on one crank case, using a one-piece heavy drop forged crankshaft, which eliminates gears, clutches and couplings. A cast steel frame does away with useless weight and minimizes vibration, insuring longer life.

The THOR SIX inaugurates a NEW STANDARD of Compressor efficiency and performance. On the basis of "more air for your money" it deserves an investigation on your part. Get all the facts before you buy. Compare results—check performance—consider the saving you make in buying a THOR—and then decide. Your request will bring complete information immediately.

Thor Compressors are available in two sizes and in a variety of mountings. The 116 cu.ft. rated unit actually delivers 96 cu.ft. of air per minute and the 250 cu.ft. rated size, actually delivers 210 cu.ft. of air per minute.

Thor Paving Breakers. The re-coil or kick-back has been eliminated. Do not freeze in severe weather. New steel retainer prevents steel from dropping out of nozzle. Made in two sizes.

INDEPENDENT PNEUMATIC TOOL CO.

PNEUMATIC TOOLS

246 South Jefferson St.
Chicago, Ill.

ELECTRIC TOOLS

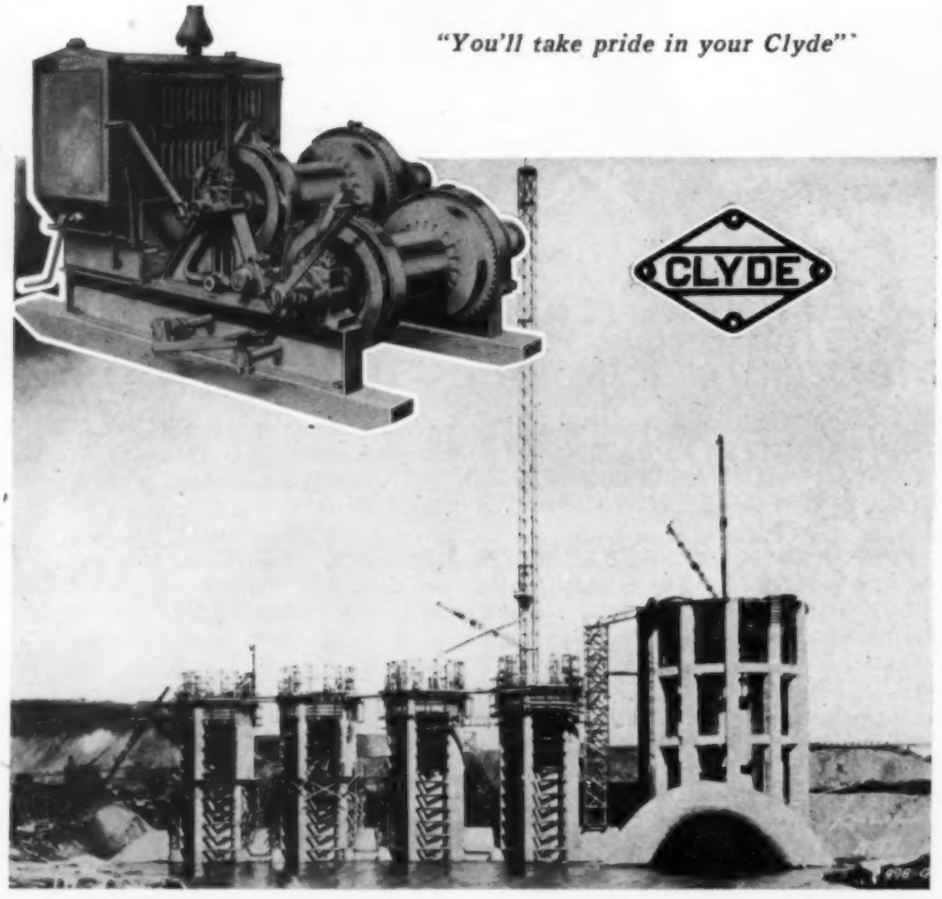
CLYDE

HOISTS-DERRICKS

Where Time Is Money—

much depends upon the efficiency and performance of the hoist. The illustration shows a Clyde 45 horsepower gas hoist working for the Arundel Corp. of Baltimore, on the Saluda River dam in South Carolina. In one continuous run of 48 hours, 2000 yards of concrete were poured.

"You'll take pride in your Clyde"



CLYDE IRON WORKS SALES CO.

DISTRIBUTORS FOR CLYDE IRON WORKS DULUTH, MINNESOTA

—BRANCHES—

NEW ORLEANS: 309 MAGAZINE ST.
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VANCOUVER, ... BRITISH COLUMBIA
1325 STANDARD BANK BLDG.

CLYDE TWO MARKS OF GUARANTEED QUALITY

SUCCESSFUL PERFORMANCE FOR AGC-A.E.

Modern highways demand this steel reinforcing

Design of steel reinforcing, a necessary adjunct to all concrete structures, has kept pace with concrete road and street construction.

In 1909 there were less than 60,000 square yards of concrete pavement in the United States.

By 1927 there was nearly 1500 times that much! The total has grown to more than 859,000,000 square yards.

The vastly increased traffic of today demands reinforcement also in the concrete bases of asphalt, brick and wood block roads and streets.

In both of these developments NATIONAL REINFORCING has been conspicuous. Its steel members strengthen over 5,000 miles of streets and highways from coast to coast. Spaced closely and accurately this network of steel insures greater reinforcing strength than larger members spaced farther apart. Welded at each intersection, they prevent slippage, require no tying and speed construction. NATIONAL REINFORCING is manufactured in varied types to meet every road-building need.

The booklets, *Practical Application of Results from Road Surveys*, and *Reprint from 1929 Proceedings American Road Builders' Association*, covering the use of fabric reinforcement in concrete road and concrete base construction will be sent free on receipt of coupon.

National Steel Fabric Company

DIVISION OF
Pittsburgh Steel Co.

4207 Union Trust Bldg. Pittsburgh, Pa.

The world's largest manufacturers of welded steel fabric

National Steel Fabric Co., 4207 Union Trust Bldg., Pittsburgh, Pa.

Send us, without obligation, *Application of Results from Road Surveys* and *Reprint from 1929 Proceedings American Road Builders' Association.*

Company_____

Individual_____

Title_____

City_____ State_____

"MOST MILES FOR YOUR ROAD DOLLARS"

"... The big wagon alone is moving more dirt than our entire horse-drawn outfit"

Such tests as this bring out the merit in any piece of equipment. So well did the Western 7-yard Crawler Dump Wagon perform that it handled more dirt than 10 horse-drawn 3-up wagons.

This was an actual experience with Trompeter & Sons on a muddy Illinois Road contract. The picture shows just how bad conditions really were.

Western Crawler Dump Wagons come in three sizes—5-yd., 7-yd. and 10-yd. capacities. The broad Athey Truss Wheels make their own track. Heavy loads can be carried through sand or soft ground, wherever a crawler tractor can move. Loads are dumped quickly and accurately.

WESTERN CRAWLER DUMP WAGONS

Important Notice

The manufacture of these wagons is broadly covered under the Benbow-Green Patent No. 1.706.099, issued to Western Wheeled Scraper Company. Other patents pending. April 11, 1929.

5-yard—7-yard—10-yard

Write for complete information on these cost-reducing machines. The Austin-Western Road Machinery Co., 400 North Michigan Ave., Chicago, Illinois. Branches in principal cities.

Austin-Western
ROAD MACHINERY

THE NEW DUAL DRIVE

Here's a Coupling You Can't Wear Out!

SEND for one of these famous Quick-As-Wink Couplings today—and test it at our risk! See for yourself that the hardest, banging usage will not put it out of commission. It can be connected or disconnected in a second but will never come apart accidentally—and will work perfectly even when covered with mud or ice or hammered unmercifully on the job.

Swivels Easy But Can't Leak and Quadruples Hose Life

It swivels freely under any condition, allowing the hose to staighten out automatically. Quick-As-Wink Couplings are guaranteed non-leaking from 1 oz. to 1000 lb. pressure. Hose kinks, ruptures or breaks are unknown.

Put One to Work on the Job at Our Expense

It eliminates accidents and prevents delays. Work is speeded up and material costs reduced. The strongest, most efficient and economical hose coupling manufactured. Every one guaranteed.

Write for One Today

Get your sample on approval, with bulletin and price, from nearest jobber below or direct from us.

John Simmons Co., 102 Centre St., New York, N. Y.
H. Channon & Co., Randolph & Wacker Drive, Chicago, Ill.
E. P. Sanderson Co., P. O. Box 5321, Boston, Mass.
The Rayl Co., 228 Congress St., W., Detroit, Mich.
Cleveland Tool & Supply Co., W. 6th St., Cleveland, Ohio.
Syracuse Supply Co., 314 Fayette St., Syracuse, N. Y.
Beals, McCarthy & Rogers, 60 Terrace, Buffalo, N. Y.
Haverstick & Co., 45 Ford St., Rochester, N. Y.
Sager & Spuck Supply Co., Albany, N. Y.
Harris Pump & Supply Co., 318 2nd Ave., Pittsburgh, Pa.
Rancher Mfg. Co., (Pacific Coast Distributor), Pomona, Calif.

C. B. HUNT & SON
637 McKinley Ave., Dept. A, Salem, Ohio

Quick-As-Wink

Dietz MONARCH

The leading light in Hot Blast lanterns

Dietz Red Globe Lanterns convey roadside warnings that are universally understood and instinctively obeyed. They afford utmost protection at minimum cost.

Use RED! No other color means danger

Dietz "MONARCH" Lanterns are the leading lights of hot blast type for roadside work. Their popularity rests upon a long record of dependable service. When the higher lighting power of Dietz cold blast lanterns is not an essential, Dietz "Monarchs" are a logical choice.

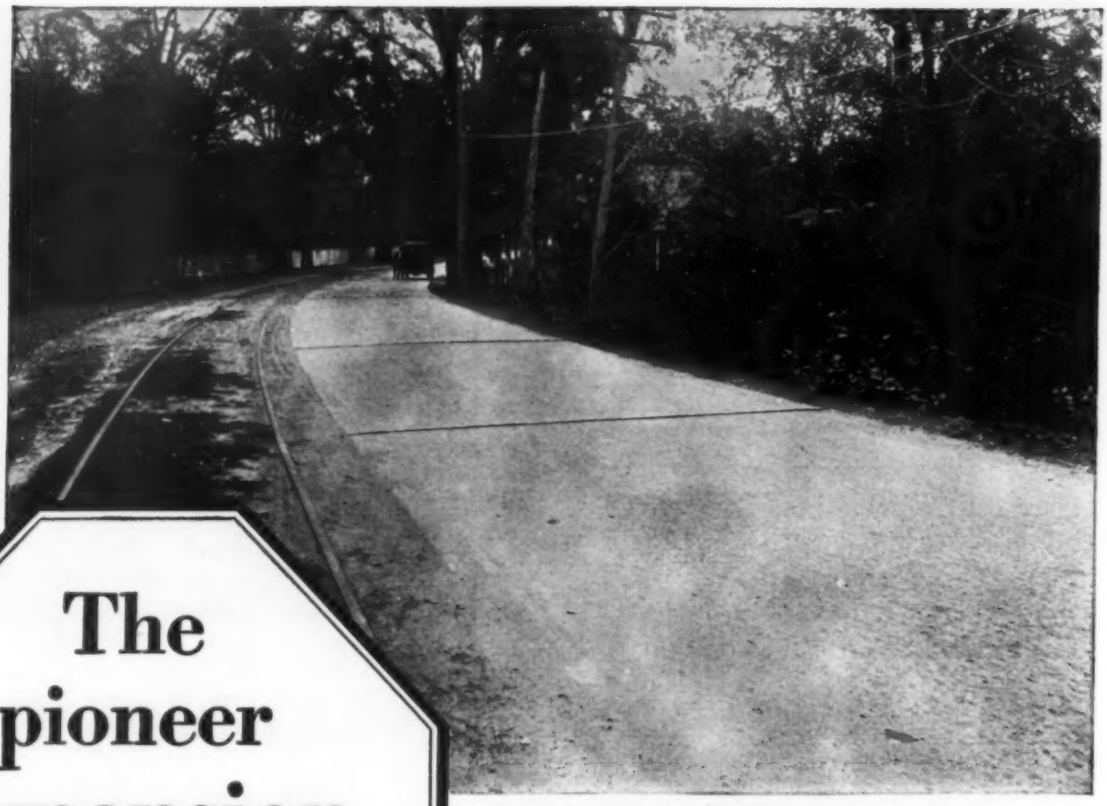
Use Dietz Lanterns—for serviceability—for economy.

R. E. DIETZ COMPANY
NEW YORK

Largest Makers of Lanterns in the World

FOUNDED 1840

DIETZ LANTERNS



The famous Old Shell Road through Alabama, lastingly protected against expansion and contraction by Carey Elastite Expansion Joint, 160 joints to the mile.

The pioneer Expansion Joint *protects* this pioneer road

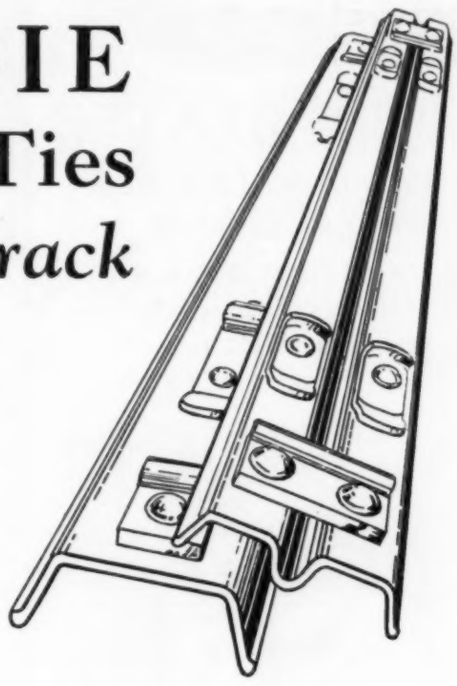
THE historic Old Shell Road, through Mobile County, Alabama, is one of the oldest highways in the South. One of the *smoothest* concrete roadways, too, in spite of the heavy, high-speed traffic that constantly pounds its surface.

Smooth because it is perfectly protected against expansion and contraction strains. Hump-proofed and hollow-proofed with the pioneer "sandwich" Expansion Joint—Carey Elastite Expansion Joint, installed in $\frac{3}{8}$-inch thicknesses, transversely every 33 feet. Cushions of fibrous asphalt, bonded under terrific pressure between holding layers of asphalt-saturated felt. The indispensable, economical, "give-and-take" protection for concrete. Write for our free manual on Expansion Joint installation.

THE PHILIP CAREY COMPANY
***Lockland*, Cincinnati, Ohio**

Carey Elastite
EXPANSION JOINT

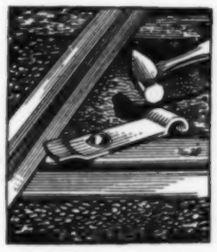
CARNEGIE
Steel Cross Ties *for Portable Track*



GETTING material to the job is of vital importance to the contractor. The foundation of a dependable transportation system is a good track, and for this purpose we recommend the use of Carnegie Steel Cross Ties.

A number of styles of tie sections and clips are available, suitable for all ordinary sizes of rail. Stationary and swing clips are riveted to the tie and a hammer blow firmly secures the rail true to gauge; or clip and bolt construction can be furnished, if desired. The ties can just as easily be removed, and repeatedly used. Lighter sections of track may be shifted as a whole.

Not only are steel ties more economical than wood ties, but the service rendered is vastly superior. The contractor who adds Carnegie Steel Cross Ties to his equipment can check trackage as one item efficiently cared for — one item from which no difficulty will be encountered to delay the job.



Carnegie Steel Company is also prepared to furnish prompt delivery on rails and splice bars. These are available in all standard sizes and are rolled to the same exacting standards of quality typical of all Carnegie products. For complete information on efficient track, write for copy of booklet—*"Light Rails—Mine and Industrial Steel Cross Ties"*

CARNEGIE STEEL COMPANY

Subsidiary of United States Steel Corporation

CARNEGIE BUILDING ··· PITTSBURGH, PA.

4

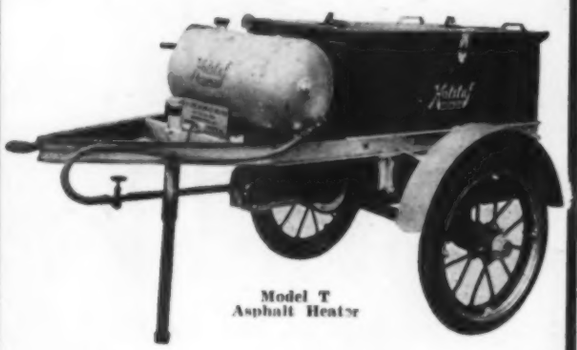
Hotstuf

TRADE MARK REG

ASPHALT HEATER

with Patented Elevated Melting Chamber

produces 30 per cent to 50 per cent GREATER MELTING EFFICIENCY and ECONOMY

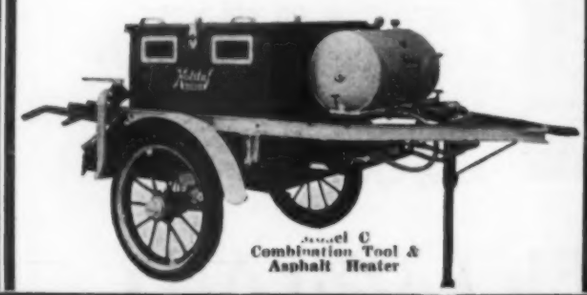


Model T
Asphalt Heater

The Hotstuf Asphalt Heater is especially adapted for road contractors, state highway and city street departments. This heater has approximately double the melting capacity of the old style wood burning kettle, and eliminates the smoke nuisance and fire hazard.

The No. 50 Heater mounted on wheels is especially suitable for patrol work, patching, filling cracks, and resurfacing, and is very economical and convenient to operate.

The Model-C Combination Paving Tool and Asphalt Heater will produce Hot Tools and Hot Asphalt in 5 minutes. Saving approximately $10 per day over old style fire wagon.



Model C
Combination Tool &
Asphalt Heater

MOHAWK ASPHALT HEATER CO., Schenectady, N. Y.
Please tell me more about the Hotstuf Asphalt Heater.
Name .....
Address .....
I am a Contractor ☐ I am a Distributor ☐

DID YOU EVER BUILD A HORSE IN 30 SECONDS?

THE TOLEDO HORSE

Just drop a piece of any 2" standard sized lumber between the jaws of two of these rigid pressed steel frames and lock the feet in an open position. Result, a complete and perfect horse, ready for use. Average elapsed time, 30 seconds.

Setting up a Toledo Horse is as simple as walking up-stairs. Locks in permanent position without springs or notches. No adjustable parts, yet ordinary thickness variations are readily accommodated.

Extreme rigidity, lasting durability and convenience of handling, make Toledo Horses ideal for highway barricades. Always ready for all general purposes, yet conveniently out of the way until wanted. Loading capacity twelve ton per pair. Available in different heights.

The frames are dismantled by a sharp upward blow on the folding brace. They fold up compactly for easy handling or storing.

The Toledo Horse is indispensable to the contractor, garage, warehouse, shop or factory. Its great utility is made available to all through its low price.

Full particulars gladly furnished.

Manufactured Only by

THE TOLEDO PRESSED STEEL CO
TOLEDO, OHIO

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For Every Power Need in Highway and General Industrial Service

WHERE hard work and heavy going are part of the daily program *put a Cletrac on the job!* Bigger loads are hauled — faster travel is attained—the difficulties of bad weather are overcome — and a definite saving of time, labor and money is made.

Large fleets of Cletracs are in use by nearly all State Highway Departments. In fleets and singly they are an important part of the equipment of hundreds of road contractors, general contractors and construction companies. Wherever real capacity and thorough dependability are demanded, there you will find CLETRACS the preferred tractors.

Cletracs are built in a complete line — a range of tractor sizes from 20 h. p. to 100 h. p. to cover every possible power need. Mail the coupon — or write for catalog and full particalars.

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19323 Euclid Ave. Cleveland, Ohio

Cletrac
Crawler Tractors

THE CLEVELAND TRACTOR CO.
19323 Euclid Ave., Cleveland, Ohio.

Send full details of Cletrac for industrial work.

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Address _____

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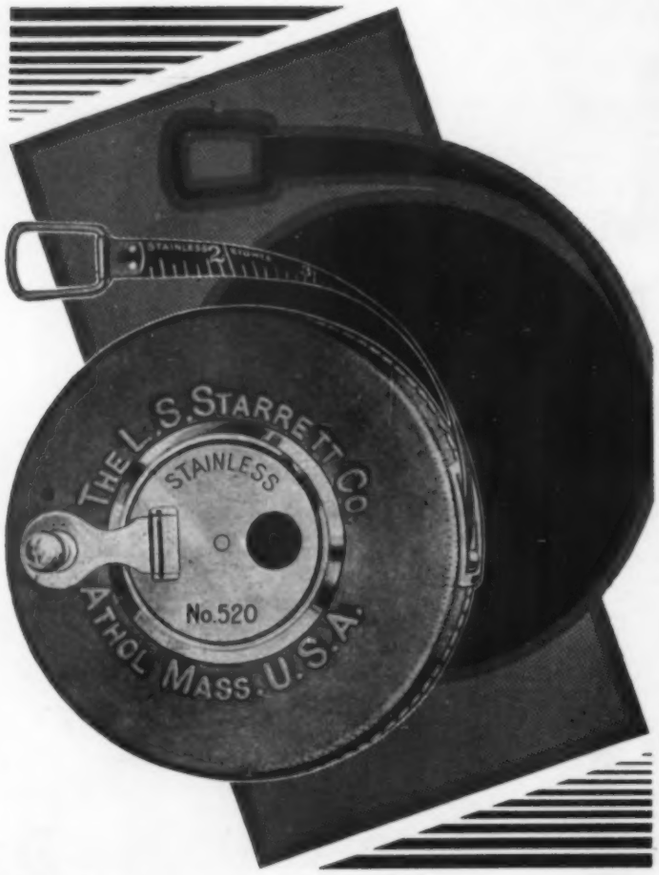

For *fast action* use a Starrett Steel Measuring Tape

Quick reading on a rush job saves time and prevents errors. Whether green or experienced men, a Starrett Steel Measuring Tape is easily and accurately handled.

The Starrett Stainless Steel Tape No. 520 offers the maximum service under the hardest kind of work. It will not rust or corrode and the graduations stay clear and bright.

Notice the Starrett method of marking, placing foot figures before each inch mark, gives you quick and accurate reading.

No. 537

No. 620

A copy of the Starrett Catalog No. 24 "NF" which describes over 2500 Starrett Tools sent on request.

THE L. S. STARRETT CO.
World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled
Steel Tapes—Standard for Accuracy
ATHOL, MASS., U. S. A.

2762

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ACCEPT NO SUBSTITUTE

Sterling

—a type—a size—a style for every contracting need. Before you buy—see a Sterling—*they'll cost you less to use.*

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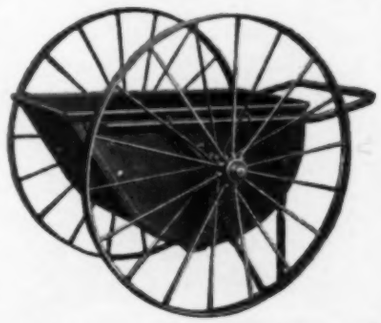
No. 31—large concrete or wet material. Capacity, 4 cu.ft. struck. *The easiest wheeling big load barrow made.* Will outlast others in toughest work.

No. 10A—wide tray, capacity, 4½ cu.ft. A.G.C. standard. Fits all contracting requirements and *built to give the longest service.* Solid and strong.

No. 61—extra narrow deep tray, capacity 3½ cu.ft. for concrete, mortar, etc. A type that will cost you *less* to use because it will last longer.



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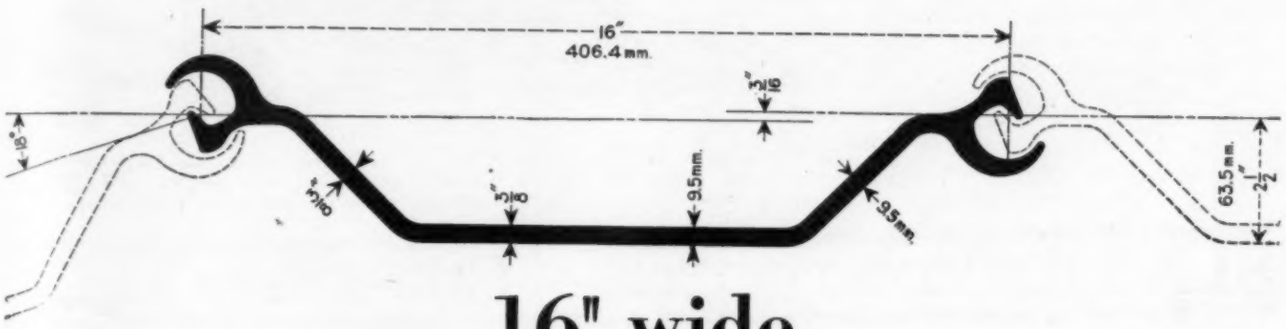
STERLING WHEELBARROW COMPANY
Milwaukee — Wisconsin

NEW!

LACKAWANNA
Arched-Web
STEEL SHEET PILING
SECTION NO. AP16



16" wide

⅜" uniform web thickness

WEIGHT *ONLY* 22 lbs. per sq. ft. of wall

Lackawanna Piling Section No. AP16 forms a narrow wall, with all webs lying in the same plane. Engineers and contractors can readily realize the economy of space, a minimum of waste excavation, and a saving of concrete when poured against the piling wall.

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Sole Exporter of our Commercial Products

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AUTOMATIC TRACTOR SCRAPER

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Does its own digging—no rooting—no scarifying.

Takes rocks, boulders and stumps. In brief, more yardage per h.p.

STRONG. Stands up to hard work, regardless of size tractor used. Lever and hydraulically operated. All steel, riveted and welded. Operated by tractor-driver.

RELIABLE DEALERS WANTED

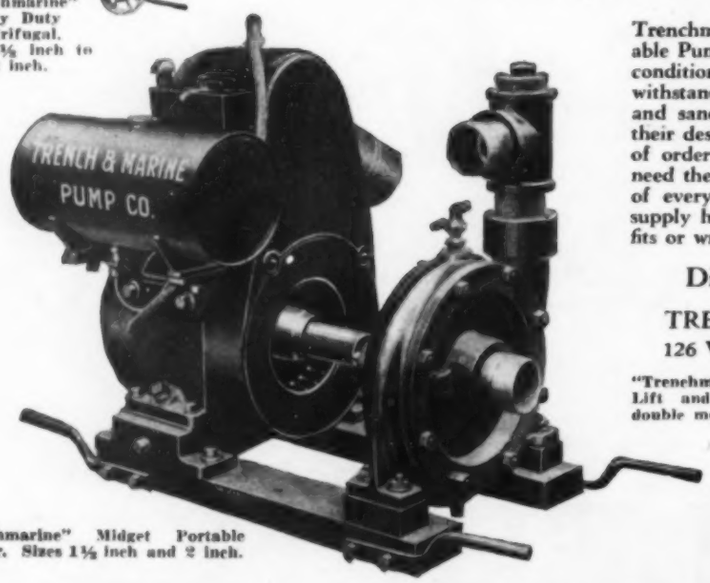
Write NOW for Bulletin giving full details of this remarkable, STRONG automatic dump scraper. A Western product—but will soon be used all over the country. Get full information today and cut down your "scraping" costs.

SLATE CONSTRUCTION CO., Albany, Oregon

TRENCHMARINE PORTABLE PUMPS

—built for an extra measure of Service!

"Trenchmarine" Heavy Duty Centrifugal. Sizes 2½ inch to 10 inch.



"Trenchmarine" Midget Portable Pumper. Sizes 1½ inch and 2 inch.

Trenchmarine Centrifugal and Diaphragm Portable Pumps are dependable under every pumping condition. We purposely build them oversize to withstand unusual abuse on the job. Dirty water and sand cannot clog them. The simplicity of their design means fewer working parts to get out of order and cause pump tie-up, just when you need them most. Priced to meet the pocketbook of every contractor, large or small. Ask your supply house about Trenchmarine Pumping Outfits or write us direct.

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"Trenchmarine" Diaphragm Ball Valve Lift and Force Pump. Single and double models. Sizes 3 inch and 4 inch.

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530-65

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for Minimum Headroom Clearance

IF you operate in a locality where low bridges are encountered, purchase a Rogers Girder Type Trailer.

To load, the rear wheels are removed, the shovel straddles the trailer, the frame is jacked up and the rear wheels replaced. As illustrated, the load is raised only a few inches to clear the ground.

Loading is not as quick as with our standard deck type trailers, but it is unnecessary to unload, move forward and reload when low clearances are encountered.

These trailers also embody the Patented Rogers Oscillating Axle.

There Is A

ROGERS TRAILER

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5 to 100 Tons Capacity

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Rogers Bros. Corporation
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4 to 12 Balanced Wheels

A Watson-Stillman Hydraulic Bender Bending Conduit Pipe for Subway Work. Note the economy of Labor.

DO YOU BEND MUCH PIPE?

If you do you need a

Watson-Stillman Hydraulic Pipe Bender

These machines are not only rapid and economical of labor, but the bends are made uniform and without danger of buckling or crushing.

We build pipe benders in a variety of types and sizes as well as a full line of Hydraulic Machinery, including jacks, pumps, accumulators, presses, shears, etc.

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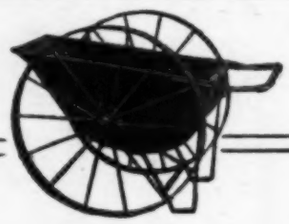

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Keeping pace with the modern trend toward reduced costs of material handling, this company has devoted real engineering and manufacturing skill to the development and constant refinement of its complete line of wheelbarrows, carts and scrapers for every contracting, mining and industrial use. Because of their perfection of balance and advanced principles of construction, Bull Frog products are making it easier for men everywhere to do more work, with resultant profit to their employers. You, too, can benefit through the use of this modern equipment. Our new catalog shows the complete line; send for your copy.

THE TOLEDO WHEELBARROW CO.
TOLEDO, OHIO
Branch Office and Warehouse
CHICAGO—69 E. Wacker Drive

BULL FROG WHEELBARROWS

"Here, Lad—

My past experience as a building contractor tells me that we're in for a big cost before starting on the addition to that old office building.

You see, tearing out the old walls to frame the beams into the columns is something which will cost us lots of money and may bring us out shy on the contract."

"Yes, Pop—

and I feel a bit shy in reminding you that we're not doing this contract on your *past experience*—but rather your present experience.

It won't be necessary to tear down the old walls.

The framing connections can be made by removing the brick veneer and framing the new floor beams into the columns by means of arc welding.

Then it will be possible to stiffen the old columns, where necessary, by this same 'Stable-Arc' process.

So you see, Pop, the only way we'll come out shy will simply be by shying clear of extra work.

Thus you can be shy in more ways than one—like a woman telling her age."

The Lincoln "Stable-Arc" Welder

—welds easier
—makes better welds
—permits greater output

because of the steady uniform arc throughout entire welding range, which is the result of:

Variable voltage design
Laminated magnetic circuit
Separately-excited generator field
Double control of welding heat
All steel construction

No other welder has all these features

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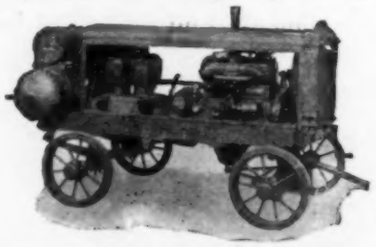
Let us show you.

W. A. RIDDELL CO.
BUCYRUS, OHIO

AIR COMPRESSORS
for any job



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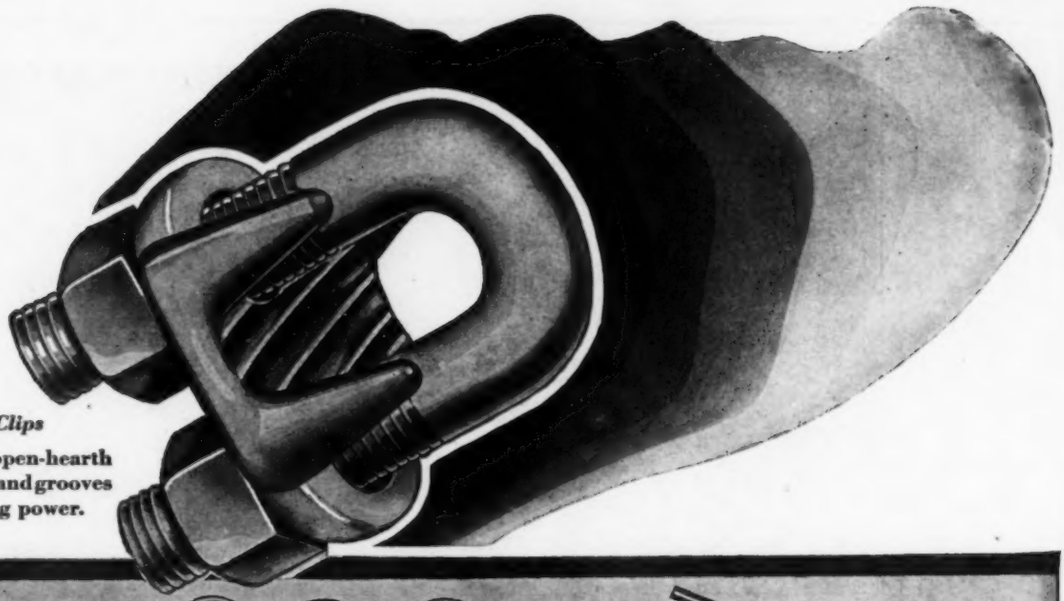

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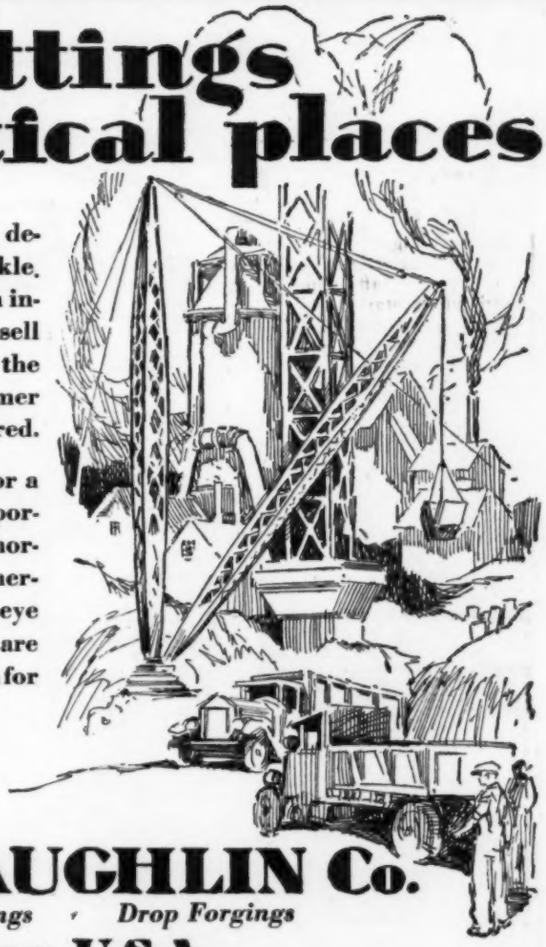
Of drop forged open-hearth steel. Concave base and grooves afford great holding power.

Wire rope fittings for critical places



A DERRICK guy gives way bringing death and destruction . . . because of a flaw in a turnbuckle. Your customers cannot afford to take chances with inferior turnbuckles . . . or you to sell them. When you sell turnbuckles and other hardware items which carry the LAUGHLIN trademark, neither you nor your customer takes a chance. Quality and durability are assured.

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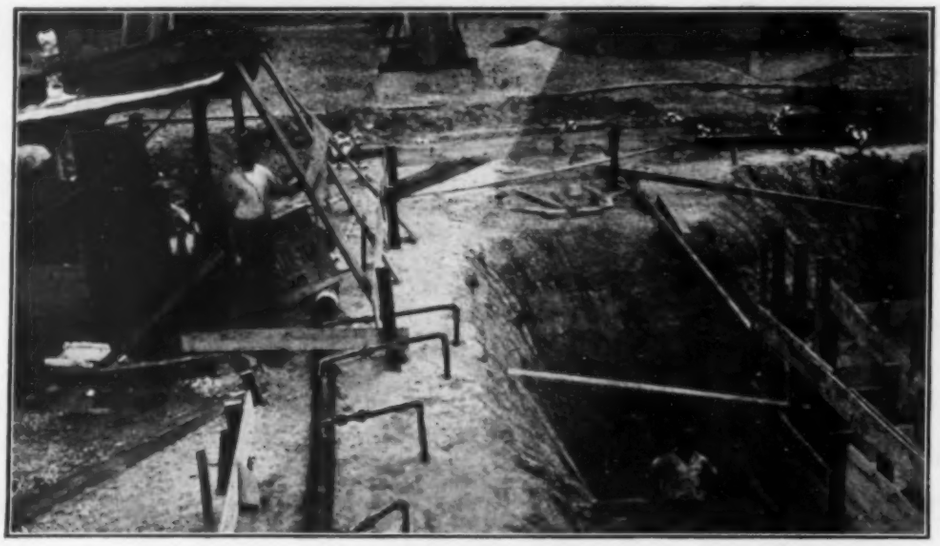

NO 'FRAID

Can't cave—don't need sheeting. Different before—tried everything for months. The right thing took two days. Don't know what the hole is for. One of the big powder companies is putting it in. Stood our demonstrator on his head—looking for matches, before passing him along. Safety First. Now they have a brand new safety rule for their wet excavations—Put a Moretrench Wellpoint System in first.

MOORE TRENCH MACHINE COMPANY, Rockaway, New Jersey

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The MODERN WAY TO HOIST BUILDING MATERIALS

OK PORTABLE ELEVATOR

The OK Portable Elevator is designed as a time and labor saver for builders. It hoists brick, mortar, and similar materials in wheel barrows or concrete buggies, quickly and easily. The chief feature which makes this elevator a good investment is that the entire equipment may be moved to the job on a truck, erected in a short time, and when the work is finished, dismantled and moved to the next job, without lumber loss as with wooden towers and at low labor cost.

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Ask about OK Air Compressors and OK Portable Hoists.

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Cut [& Whip] Cable to Thread Easily . . .

No Brazing

CABLE cut this new, quick way leaves both ends incased in a steel band—a clean whip for passing thru sheave-blocks, thimbles, wedge-sockets and other fittings. No frayed ends, no brazing, no cut hands. Saves time.

In Less than 1 Minute

one man whips and cuts (in one operation) any size cable up to 1" with the Starrett Cable Cutter. Inexpensive, easily carried; two sizes. Handy kit tool for cable up to 1" (8 lbs.) Larger cutter for cable up to 1½" (20 lbs.)

STARRETT *Steel Band and Cable* CUTTER

Write for prices and details.

MORSE-STARRETT PRODUCTS Co. *Dept. B*

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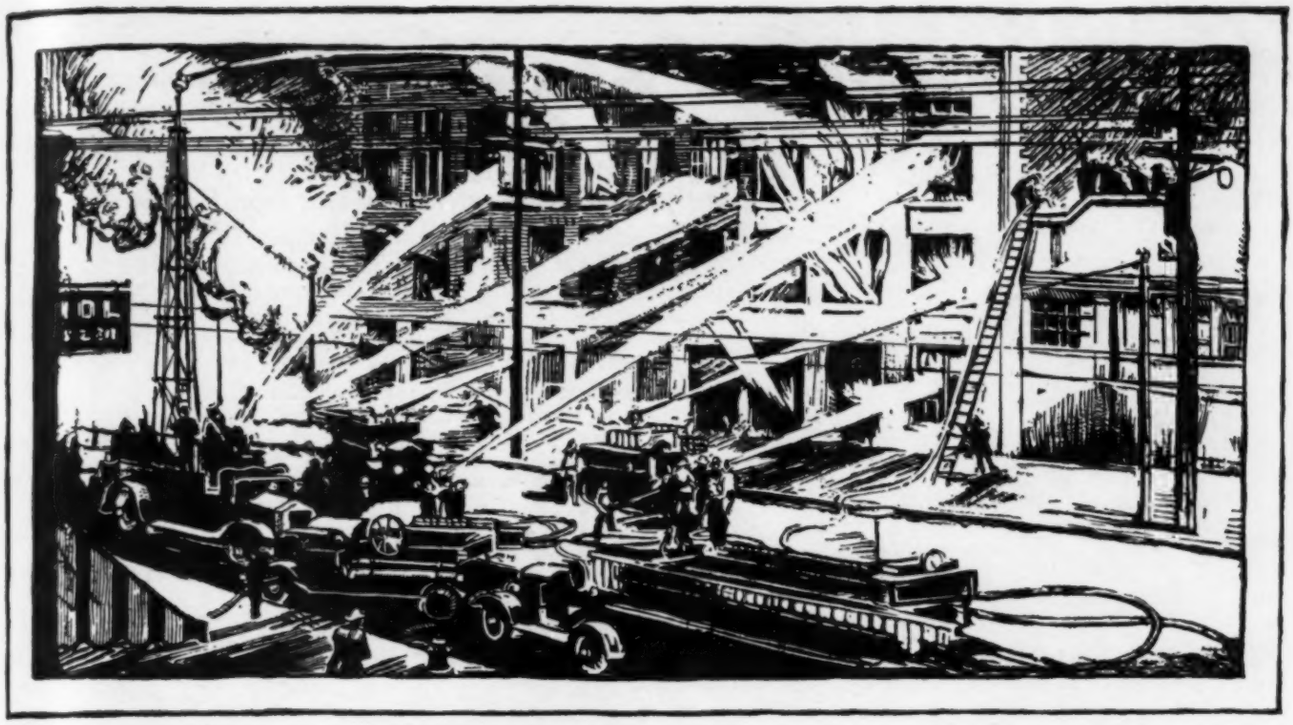

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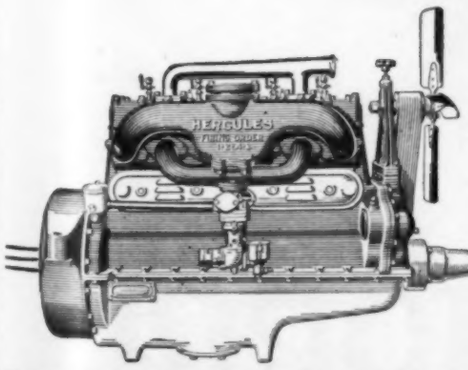
Fire-hose quickly connected to hydrant . . . the Hercules equipped Seagrave Suburbanite Pumper throbbing powerfully . . . and into the blazing building is poured a quenching flood of water at the rate of 500 gallons per minute!

In providing power for pumping high pressure fire fighting streams Hercules dependability is never more dramatically proved. In other fields, Hercules sets just as high a standard of performance—furnishing heavy-duty power for varied types of industrial and oil-producing machinery and automotive equipment.



Well-known manufacturers of pumping outfits have standardized on Hercules.

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You'll find many jobs well suited to

The Killefer Road Ripper!

It will break out material for scrapers, graders, bulldozers, loaders or may be used for road plowing, roughing out or bonding.

The No. 10 Killefer Road Ripper working 12" deep in 3" of asphalt macadam on 9" of coarse gravel ballast.

Works as deep as 12"—
Quick-detachable points are practical and economical—
Has a rapid power-lift—
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Built in 2 tractor models.

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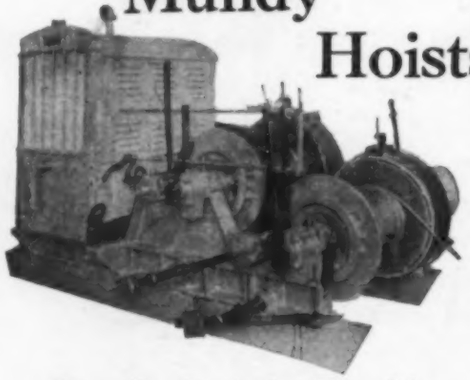

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To make your unwatering and water supply problems easier!

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MORRIS
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Dig More and Stand the Gaff Longer

"CONTRACTOR" BUCKETS
For fast rehandling the speed of a Haiss "Contractor" Bucket will please even the most critical. And in quality, this bucket ranks at the top.

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"HI-POWER" Buckets

EVERY contractor who wants buckets with longer life and extra digging ability should certainly investigate Haiss "HI-POWER" Buckets. Their Electric Steel hinges, bowl bracing and head pieces and their enormous closing power are earning a worthwhile reputation everywhere. We'll gladly send you the Haiss *Bucket* Catalog which tells all about Haiss Buckets.

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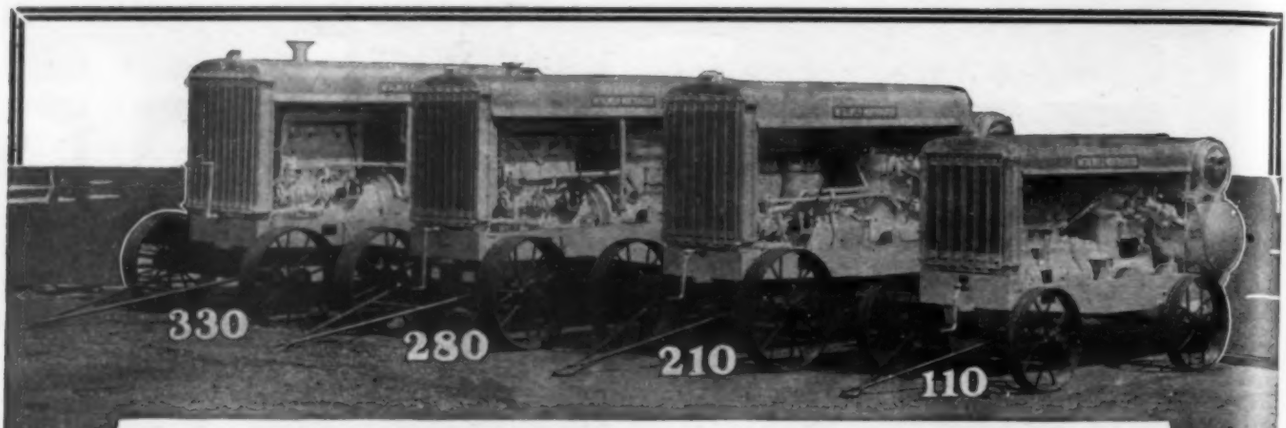
"LEVER ARM" BUCKETS
The Haiss "Lever-Arm" is the bucket for the man who has found this type bucket best suited to his needs.



The Metalweld-Worthington "AIR KING" has sounded a new keynote in Portable Air Compressors. Not only does the "AIR KING" embody the most advanced engineering principles in air compressor construction, but it has actually proven its dollars-and-cents value and labor-saving ability in daily use by the leading road builders, public utility companies and railroads throughout the country.

Worthington "Feather Valves"—Force Feed Lubrication — Counter-balanced Crankshaft — All-steel Welded Frame—these are but a few of the M-W features that make the "AIR KING" the outstanding buy in Portable Air Power.

Furnished in 28, 110, 160, 210, 280 and 330 cu.ft. sizes.

METALWELD, INC., 26TH AND HUNTING PARK AVE., PHILADELPHIA
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METALWELD-WORTHINGTON
PORTABLE AIR COMPRESSORS

The UNIVERSAL SAND TESTER

This little instrument will tell you whether your sand is good or poor *before* you use it, and give you the facts with a permanent record, quickly and cheaply.

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Company .....
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A Sensational Performer and Money Saver

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It makes small jobs profitable. Fast, full ¾ circle swing, 1/3 yard dipper capacity, 16½ foot radius, gasoline power.

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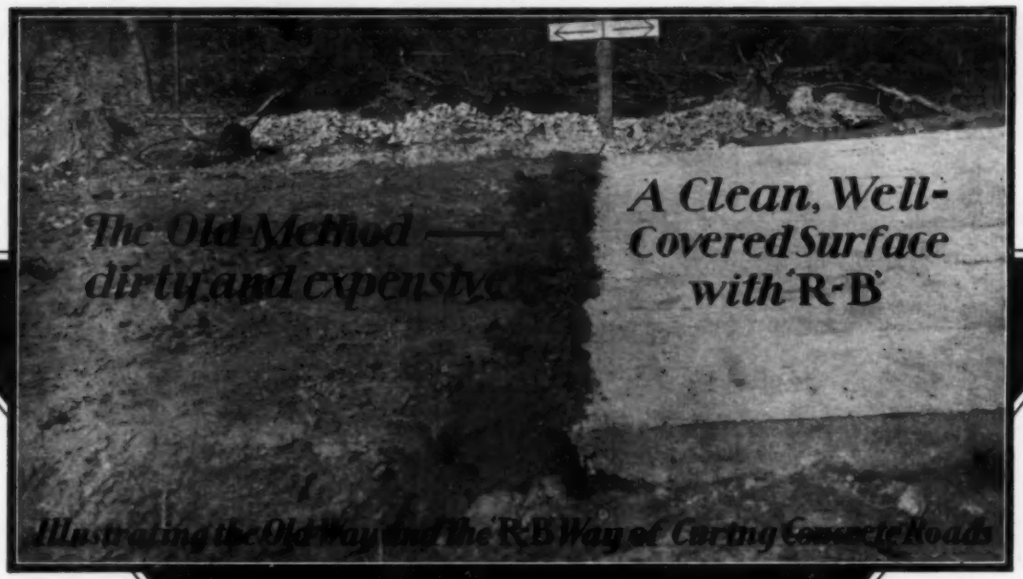

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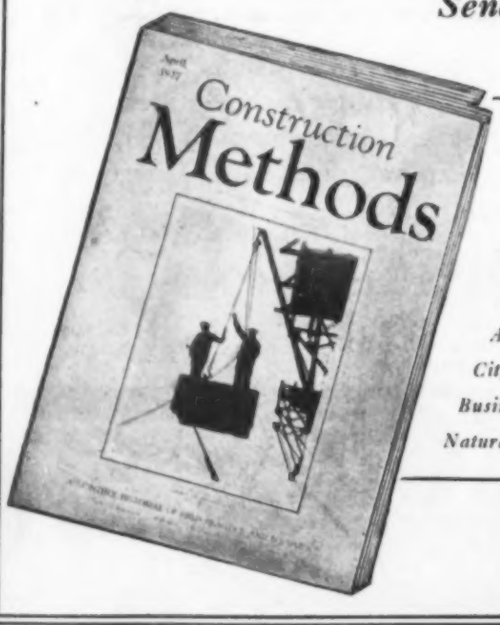

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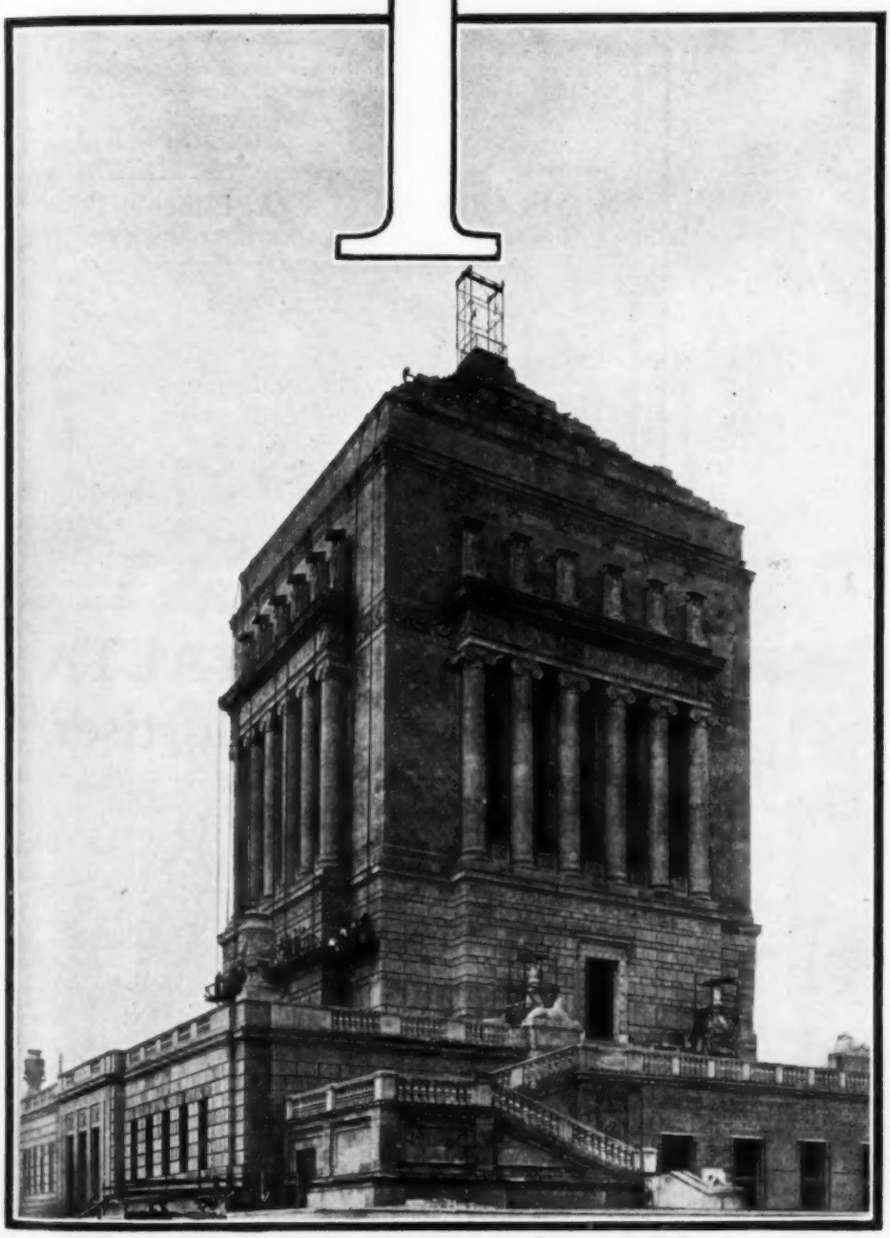

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Walker and Weeks, *Architects* The Hunkin-Conkey Constr. Co., *Contractors*

Every day in every section of the United States, American Tubular Towers are proving their economic worth to Contractors for both material elevating and concrete handling . . . efficiently aiding in the construction of jobs of all types.

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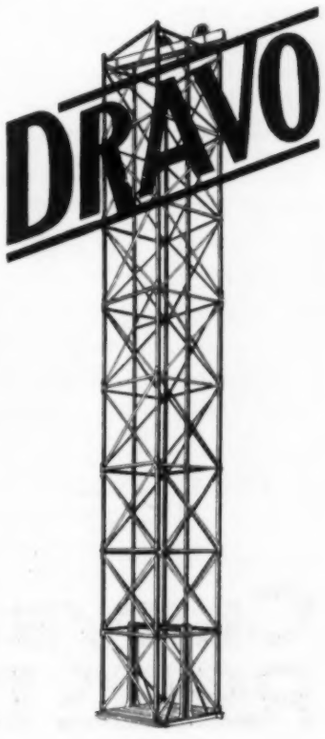

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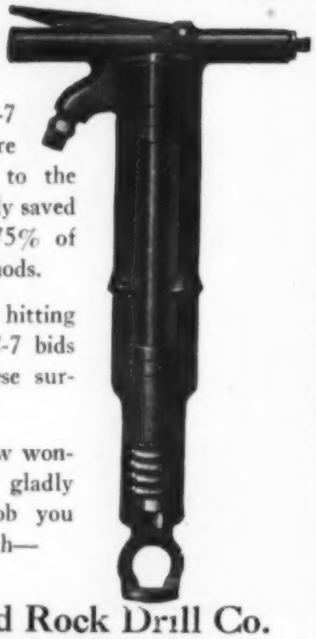

The new Cleveland C-7 Paving Breaker! A more than worthy successor to the famous C-6 that regularly saved 50% of the cost and 75% of the time over hand methods.

Improved in design and hitting power, the Cleveland C-7 bids fair to eclipse even these surprising performances.

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Branches, Agents and Service Stations in Principal Cities of the World.

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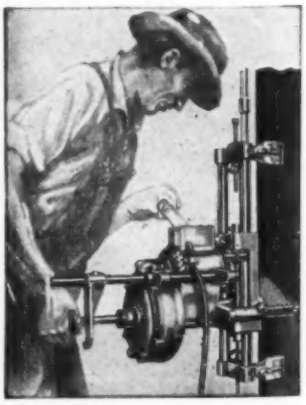

You can cut four times as many mortises, including lock and face plate in one operation, in an hour with an ALTA.

It's the fastest tool of it's kind in the world and with its speed is combined absolute accuracy. For jobs where electric power is not available use our hand power model.

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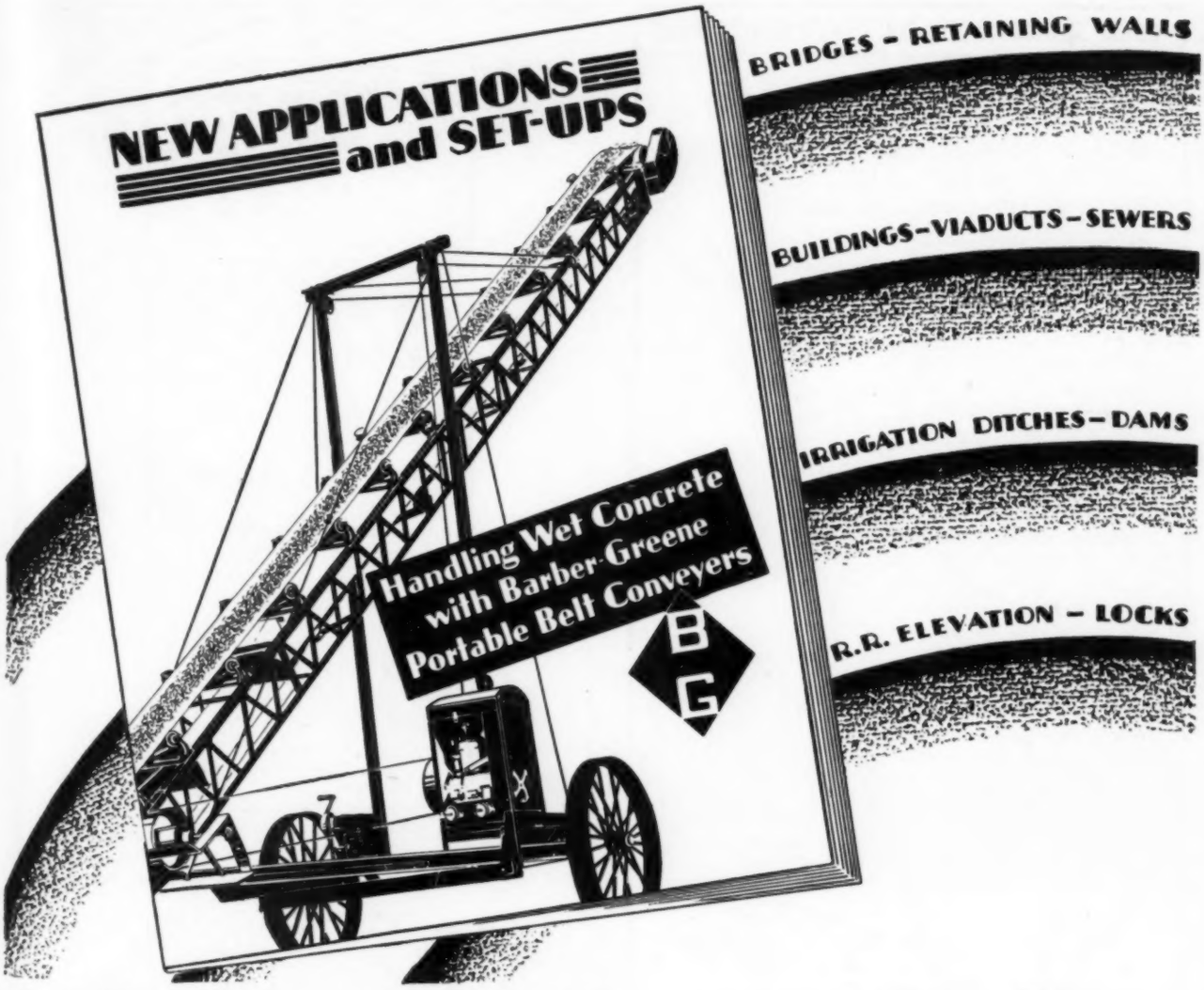
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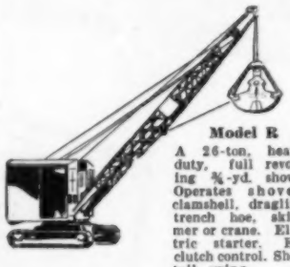
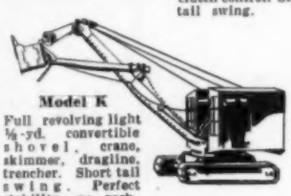


Model R
A 26-ton, heavy-duty, full revolving ⅝-yd. shovel. Operates shovel, clamshell, dragline, trench hoe, skimmer or crane. Electric starter. E-Z clutch control. Short tail swing.



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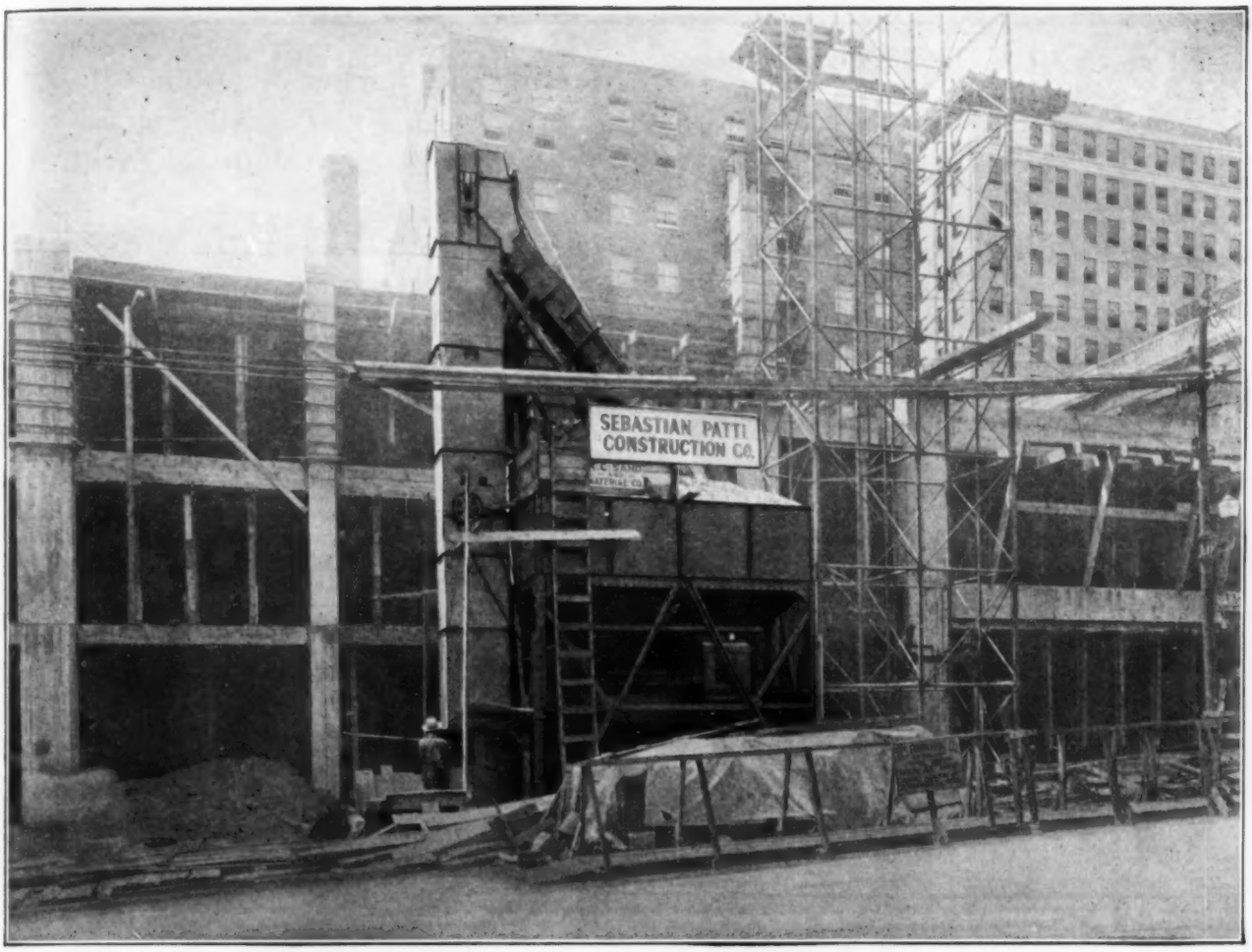

A Butler Bin loaded with a bucket elevator solves a lot of problems in city construction

WHERE the curb is the limit for building and everything must be handled inside that limit, Butler Bins fit like a coat of paint.

Aggregates are dumped from motor trucks into the boot of the elevator which conveys same into the bin, then through the measuring or weighing hoppers into the mixer, and from the mixer into the tower elevator by gravity.

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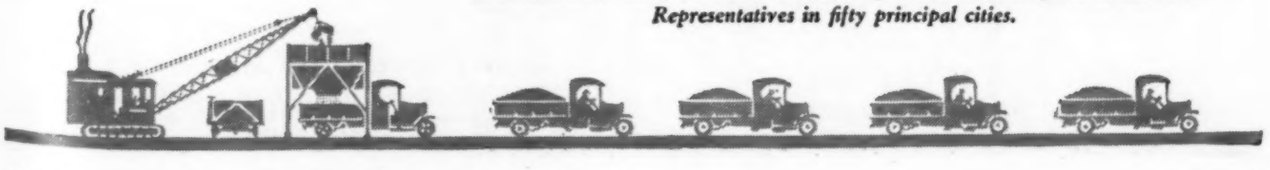
Representatives in fifty principal cities.



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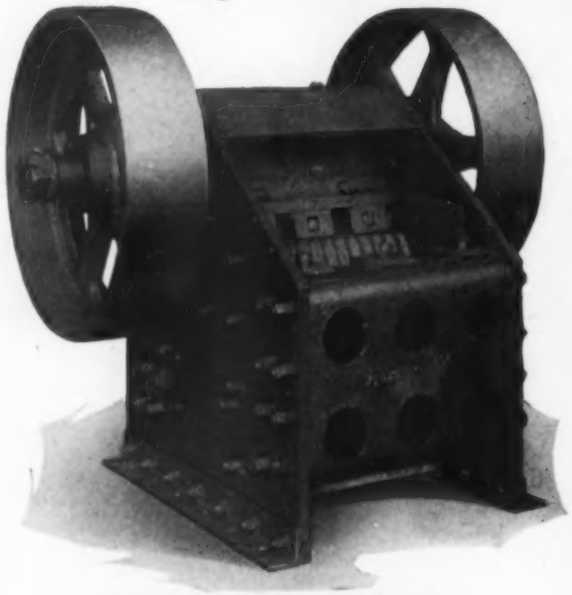

No. 1030 Champion Reduction Crusher

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Self-aligning bearings used throughout.
"The most expensive bearing made."

Meeting the market demand
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CHAMPION
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Distinctive—in being equally effective as primary or secondary breakers. The ideal dual purpose crusher for the smaller operator, contractor and chemical or industrial trades. Particularly efficient as a fine reduction unit in large producing plants.

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CHAMPION ROCK CRUSHERS—PRIMARY TYPE, AND EQUIPMENT FOR THE ROCK CRUSHING AND SAND AND GRAVEL INDUSTRIES. THE ENGINEERING AND INSTALLING OF COMPLETE PLANTS.

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Dixon's "677" is the right answer. Its double film (grease and graphite) absolutely eliminates metal to metal contact; no matter how hot the weather, how steep the grade, or how heavy the load.

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WITH Cleveland Bolt Sleeves full salvage of bolts is possible no labor is wasted cutting off bolts, smoother construction follows. And only one man is needed to remove the bolts.

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The Cleveland Container Co.
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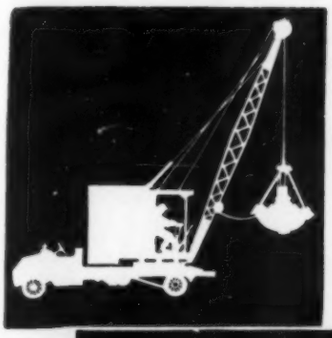
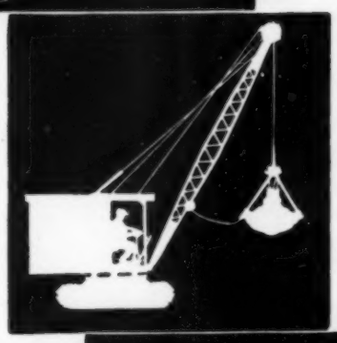
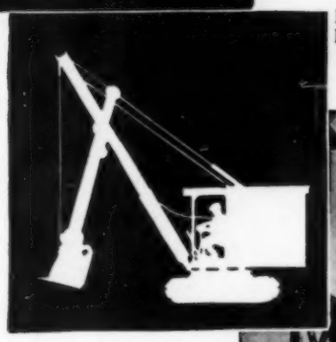
Manufacturers of Paper Tube Products for the Construction Industry







A Browning crawler—crane or shovel—is so speedy in operation, so easy to handle and so sturdy in construction that it assures constant peak production at the lowest possible cost.

You can use a Browning crawler on any job, anywhere and make it pay for itself out of its earnings.

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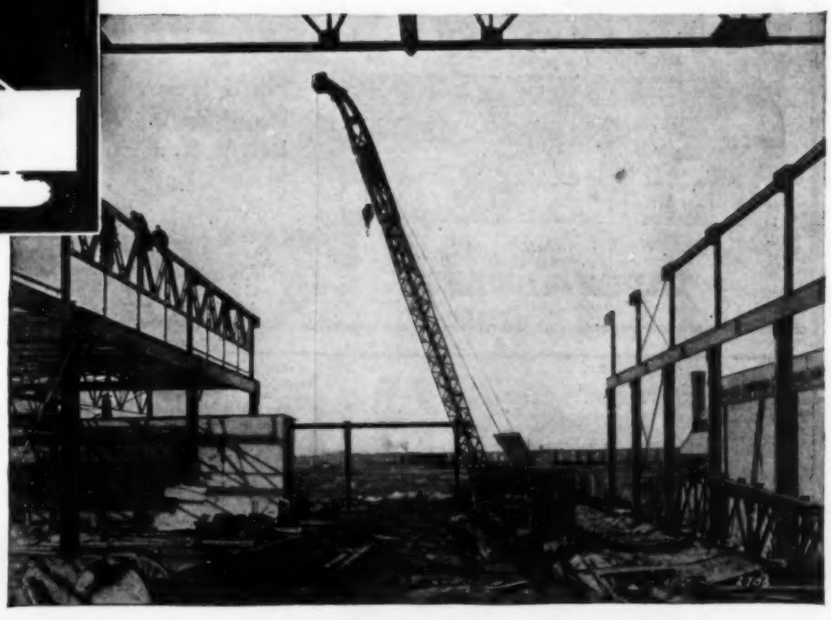

A Browning Crawler Crane erecting steelwork for The C. H. Tenswold Steel Erecting Company, Chicago, Illinois.

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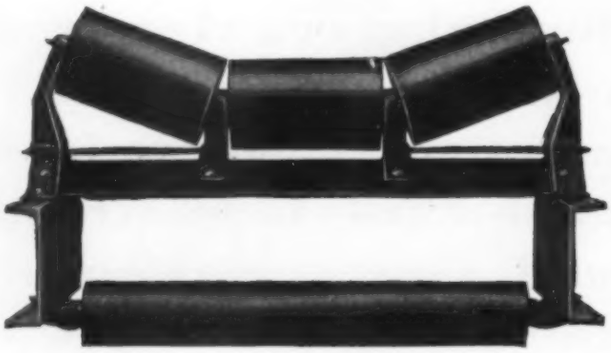
LOCOMOTIVE • TRUCK • CRAWLER CRANES



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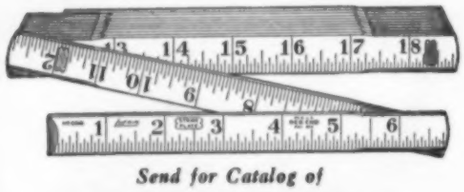
YOU CAN'T BUY A BETTER FOLDING WOOD RULE



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This means a chain that lasts longer and that reduces chain costs for customers. Every link of this famous INSWELL CHAIN is now branded with the initials C-M by this Company. With this distinguishing mark it is easy for you to identify the real "INSWELL" Chain.

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Also manufacturers of the famous Dreadnaught Tire Chains

General Sales Offices: Tonawanda, N.Y.
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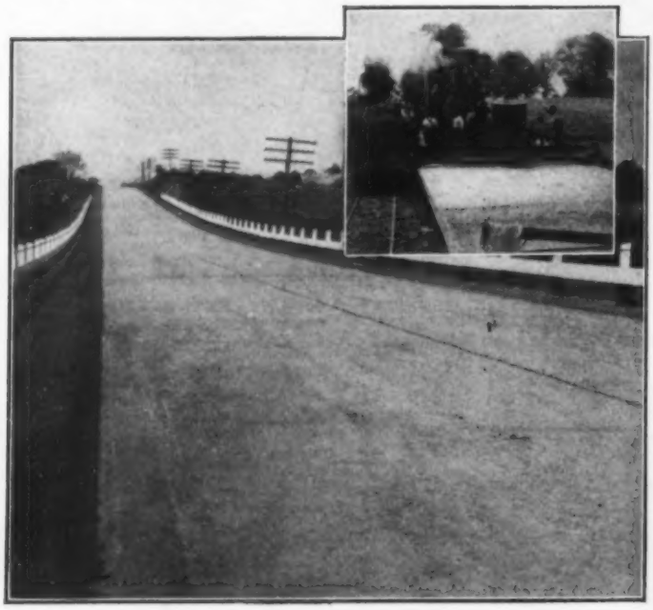
Concrete Jobs completed in LESS TIME by this QUICKER CURE



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77-80%

"3-C" 77%-80% Calcium Chloride is manufactured by the Columbia Chemical Div., Pittsburgh Plate Glass Company under Patents No. 1,592,971 and 1,527,121.

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Please send complete information about "3-C" Calcium Chloride for concrete curing.

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Self Loading Scrapers

The original self-loading scrapers continue to show their ability to move large quantities of dirt with two to three men. They dig, load, haul, dump and compact the dirt as a single outfit.

They are available in three sizes—¾, 1 and 1½ cubic yard capacities to suit your job or your tractor.

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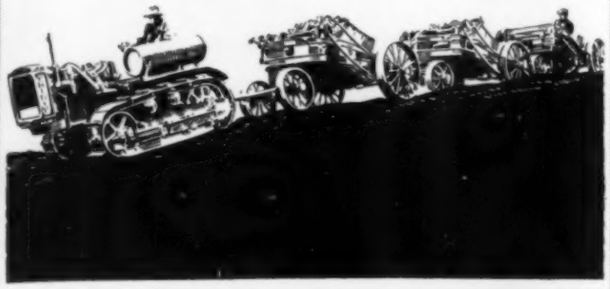
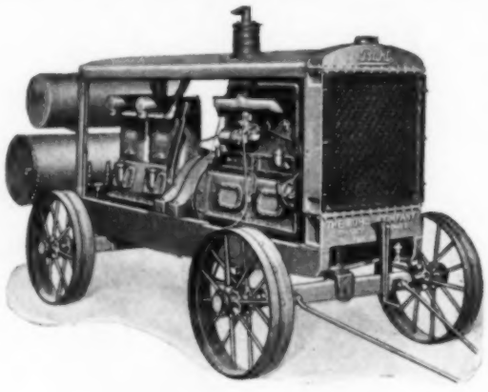
Bulletin No. 256—Baker Rotary Scrapers ☐
Bulletin No. 270—Baker Road Maintainers ☐

The Baker Manufacturing Co.
568 Stanford Avenue, Springfield, Illinois





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Leading contractors, railroads, public utilities, municipalities and industrial concerns everywhere are using BUHL Portable Air Compressors because they embody improvements that are "Years Ahead" and result in greatly reduced production costs of compressed air.

The BUHL Line offers the widest possible selection of portable compressors in sizes 36, 55, 90, 100, 110, 220 and 330 cubic feet displacement with any type of mounting desired.

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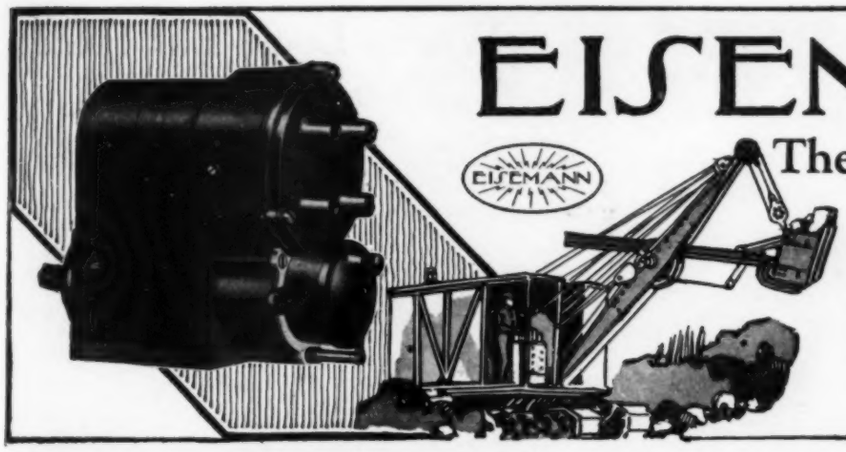
The Buhl Company
Old Colony Bldg., CHICAGO



EISEMANN

The Foremost Magneto

for Construction Equipment

The overwhelming choice of the builders of high quality equipment. Favored by contractors everywhere.

EISEMANN MAGNETO CORPORATION
165 Broadway - New York

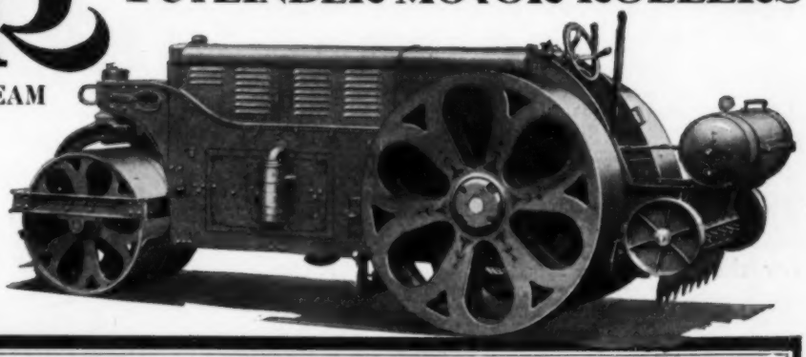
HUBER 4 CYLINDER MOTOR ROLLERS

POWERFUL AND DEPENDABLE AS STEAM
EASY TO HANDLE
SINGLE LEVER CONTROL

MADE IN FOUR SIZES

5-7-10-12 tons

SEND FOR
HUBER ROLLER CATALOG



315 E. CENTER ST. THE HUBER MANUFACTURING CO. MARION, OHIO

Have You Secured Your Copy of

"Excavating in Pre-Drained Wet Soils"?

This "Copyrighted" illustrated booklet contains much data of value to every Engineer or Contractor doing work in wet soils.

The edition is limited so you better fill out and mail coupon today.

DOMESTIC ENGINE & PUMP CO.
N. Queen St. and P. R. R.
SHIPPENSBURG, PENNA.

FREE OFFER—Without expense or obligation to me—please send your copyrighted booklet "Excavating in Pre-Drained Wet Soils."

Name .....

Firm .....

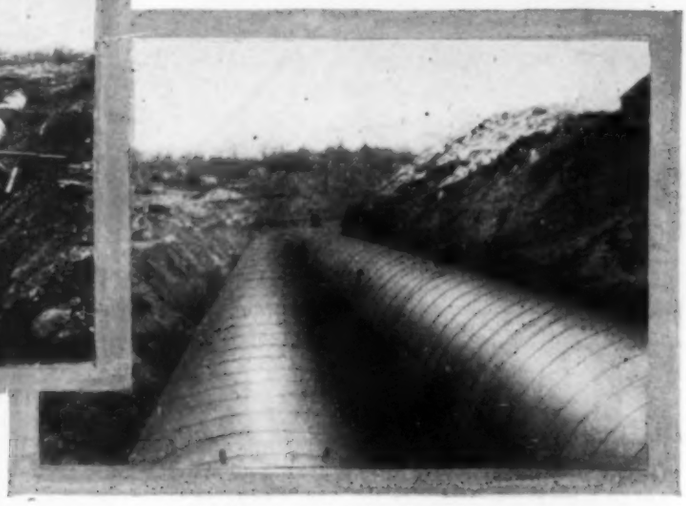
Address .....

.....

7-29

Where Lock-Bar Steel Pipe led the field!

74-in. Lock-Bar Steel Pipe line and cross connection chamber north of Pompton Plains Cross Road, Station 297, Wanaque Aqueduct.



Twin 74-in. diameter Lock-Bar Pipe line looking north, Wanaque Aqueduct.

The economy, unusual strength and dependable service of Lock-Bar Steel Pipe are responsible for its ever-increasing popularity.

The pictures show some of the 164,000 ft. of 74-inch Lock-Bar Pipe now being installed for the Wanaque Aqueduct, North Jersey.

EAST JERSEY PIPE COMPANY
7 Dey St., New York, N. Y.

LOCK-BAR
STRONG AS THE Before Closing PLATE ITSELF

A Personal Want—

can invariably be filled by a friend.

The Searchlight Section

of this issue covers the current business wants of the industries in which this paper is read.

For Every Business Want
"Think SEARCHLIGHT *First"*

A Business Want—

must be satisfied by someone in your industry.

0134

Splendid Gloves

Sabin Co.,—Gloves
536-40 W. Federal St.,
Youngstown, Ohio

Send me information on Sabin Gloves.

Name .....

Address .....

.....

If you wish a pair of No. 108 Gloves enclose $1.35 and check here ☐

$1.35 Per Pair

A splendid pair of gloves for hard wear. Popular among all field and construction workers. Grey buffed cowhide hand, protected sides of fingers, Canton flannel back, 6-inch canvas cuff. Hold-tight back prevents dropping off.

SABIN CO. GLOVES
536-40 W. Federal St., Youngstown, O.

Who's Getting the Big Contracts?

A Monthly Guide to Where the Construction Dollar is Being Spent

Far West

South Gate, Calif.
Factory: $1,000,000
J. V. McNeil Co., 5860 Avalon Blvd., Los Angeles.
Wilmington, Calif.
Gas Refining Plant: Est. $3,000,000
C. F. Braun Corp., Alhambra.
San Francisco, Calif.
Office: $3,000,000
P. J. Walker Co., Sharon Bldg.
San Francisco, Calif.
Pier Sheds: $178,600
L. M. King, Crocker Bldg., San Francisco.
Los Angeles, Calif.
Studio: Est. $1,000,000
Scofield-Twaits Constr. Co., 1100 Pacific Finance Bldg.
Stockton, Calif.
Dam: $838,715
Bent Bros., 418 Pecan St., Los Angeles.
Seattle, Wash.
Tunnel: Est. $1,500,000
Rumsey & Jordan, Lumber Exchange Bldg.
Seattle, Wash.
County Building: $2,148,708
H. Paderson, Seattle.
Los Angeles, Calif.
Aviation Plant: $5,000,000
Sumner-Sollitt Co., Los Angeles.

West of Mississippi

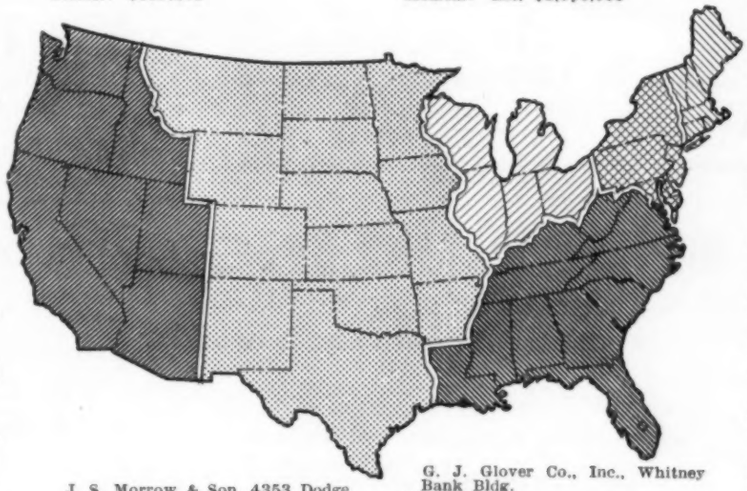
Omaha, Neb.
Sewer: $462,932
Hoag & Rollins, Inc., Toledo, O.
San Angelo, Tex.
Dam: Est. $500,000
West Texas Utilities Co., San Angelo.
Butler County, Iowa
Roads: $246,200
Wagner-Erling Co., 516 Security Nat'l Bank Bldg., Sioux Falls.
Dubuque, Iowa
Printing Plant: Est. $300,000
Schafer & Olson, Chippewa Falls, Wis.
Ottawa, Iowa
Power Plant: $250,000
Federal Engr. Co., Centerville.
Del Rio, Tex.
Power Plant: $1,500,000
L. E. Myers Constr. Co., Allen Bldg., Dallas.
Wichita, Kan.
Hotel: $1,750,000
Manhattan Constr. Co., Court Arcade Bldg., Tulsa, Okla.
Waco, Tex.
Waterworks Improvements: $536,942
W. E. Callahan Constr. Co., Kirby Bldg., Dallas.
Texas
Gas Pipe Line: Est. $4,000,000
Magnolia Gas Co., c/o San Antonio Public Service Co., 201 North St. Mary's St., San Antonio
Great Falls, Mont.
Hospital: Est. $1,000,000
C. O. Jarl, Great Falls and H. J. Hammill, Bozeman.
El Paso, Tex.
Refinery and Gas Plant: $1,000,000
Max B. Miller & Co., 501 5th Ave., New York City.
Enid, Okla.
Hotel: $886,000.
D. C. Bass, Enid.
Ponca City, Okla.
Generating Plant: Est. $2,000,000
General Electric Co., et. al., Oklahoma City.
Ft. Worth, Tex.
Department Store: $2,000,000
H. B. Freidman, Ft. Worth.
Denver, Colo.
Mausoleum: $1,000,000
Arvid Olson Constr. Co., Patterson Bldg., Denver.
Minneapolis, Minn.
Store: Est. $600,000
J. & W. A. Elliott Co., 903 Lumber Exch. Bldg.

Middle West

Cleveland, O.
Office: Est. $5,000,000
Aronberg-Fried Inc., Terminal Tower.
Chicago, Ill.
Viaduct and Approaches: $778,800
Great Lakes Constr. Co., 306 South Wabash Ave.
Toledo, O.
Warehouse: Est. $1,000,000
Kopitke Constr. Co., 321 Wabash St.
Chicago, Ill.
Apartment: $1,000,000
H. Janisch & Co., 1815 Winona St.
Chicago, Ill.
Hotel: $16,000,000
Starrett Bros., 8 South Dearborn St.
Chicago, Ill.
Garage: Est. $1,000,000
J. B. French & Co., 30 North Michigan Ave.
Chicago, Ill.
Garage: $2,500,000
Starrett Bldg. Co., 6 South Dearborn St.
Youngstown, O.
Bridge: $350,000
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Bensenville, Ill.
Factory: Est. $1,200,000
Continental Constr. Co., 155 North Clark St., Chicago.
Michigan City, Ind.
Factory: Est. $1,000,000
Tonn and Blank, Michigan City.
Indianapolis, Ind.
Office: Est. $1,000,000
L. Colvin, 823 Continental Bank Bldg.
Detroit, Mich.
Tunnel: $639,263
J. S. Morrow & Son, 4353 Dodge St., Omaha, Neb.
Springfield, Ill.
Flour Mill: Est. $1,000,000
Jones-Hettelsater Constr. Co., 600 Mutual Bldg., Kansas City, Mo.
Chicago, Ill.
Apartment: $1,500,000
J. T. Wheeler, 134 North Clark St., Chicago.
Jackson, Mich.
Bank and Office: Est. $1,000,000
Otto Misch Co., 159 East Columbia St., Detroit.
Kansas City, Mo.
Hotel, Office and Bus Terminal: Est. $5,000,000
Thompson Starrett Co., Inc., 250 Park Ave., New York City.
Grand Rapids, Mich.
High School: $408,888
Lovering & Longbotham, St. Paul, Minn.
Indianapolis, Ind.
Conduit: $220,000
Price Bros., Harries Bldg., Dayton, O.
Toledo, O.
Dredging, Etc.: $1,250,000
Great Lakes Dredge & Dock Co., 104 South Michigan Ave., Chicago, Ill.
Chicago, Ill.
Office and Store: Est. $8,000,000
Hegeman-Harris Co., 431 North Michigan Ave.
Michigan City, Ind.
Electric Generating Station: $10,000,000
Herlihy Bros., 228 North La Salle St., Chicago, Ill.
Euclid, O.
Factory and Power Plant: Est. $3,000,000
Austin Co., 16112 Euclid Ave., Cleveland.
Hartwell, O.
Factory: $1,000,000
Ross-Meyer-Hecht Co., Stanton St., Cincinnati.

South

Atlanta, Ga.
Steam Power Plant: Est. $10,000,000
Empire Constr. Co., Electric Bldg.
Louisiana
Levee: $702,758 and $902,900
McWilliams Dredging Co., New Orleans, La.
Jahncke Service Co., 814 Howard St., New Orleans.
Spartanburg, S. C.
Mill: $1,000,000
Fiske-Carter Constr. Co., Greenville.
Louisville, Ky.
Sewer Channel: $364,264
Carmell-Conrad Constr. Co., Todd Bldg.
Owensboro, Ky.
Sewers: $1,123,572
T. D. Nolan, 14101 Plymouth Ave., Detroit, Mich.
New Orleans, La.
Medical: Est. $1,000,000
G. J. Glover Co., Inc., Whitney Bank Bldg.
Gadsden, Ala.
Plate Mill: $1,500,000
Mackentosh-Hemphill Co., Pittsburgh, Pa.
Rockmart, Ga.
Mill: Est. $1,750,000
A. K. Adams Co., Atlanta, Ga.
Knoxville, Tenn.
Hotel: Est. $1,500,000
V. L. Nicholson, Knoxville.
Gadsden, Ala.
Mill: Est. $1,000,000
United Engineering & Foundry Co., Pittsburgh, Pa.



Middle Atlantic

New York, N. Y.
Bridge Superstructure: $189,000
P. T. Cox Contg. Co., 154 Nassau St., N. Y.
New York, N. Y.
Bridge: $731,200
Corbetra Concrete Corp., 142 West 32nd St.
Washington, D. C.
Cement Plant: $300,000
Rust Eng. Co., Dist. National Bank Bldg., Washington.
Phila., Pa.
Apartment: Est. $1,300,000
Graham Chambley Co., 3649 Filbert St.
Albany, N. Y.
Bank: Est. $3,000,000
William G. Sheehan Co., 2830 DeWitt St.
Springfield Twp., N. J.
Sewers: $426,368
E. J. Flaherty, 76 Montgomery St., Jersey City, N. J.
Bell Vernon, Pa.
Bridge: Est. $1,000,000
Lang Constr. Co., Pittsburgh.
Phila., Pa.
Sewer: $250,999
Mazzola & Morano, Inc., 739 South 7th St.
New York, N. Y.
Apartment: $1,000,000
Claremont Parkway Corp., 440 Broadway.
Pittsburgh, Pa.
Telephone Exchange: Est. $1,500,000
W. F. Trimble & Sons, 1719 Penna. Ave.
Brigantine, N. J.
Hotel: Est. $2,500,000
P. G. Hannum, Atlantic City.
Phila., Pa.
High School: $2,224,806
McCloskey & Co., Phila.
Trenton, N. J.
High School: Total $2,328,620
Karno Smith Co., Broad St. Bank Bldg.
Baltimore, Md.
Plant: $1,000,000
Framie Bros. & Haigley, 19 West Franklin St.
Pittsburgh, Pa.
Freight Station: Est. $600,000
W. F. Trimble & Sons, 1719 Penna. Ave.
New York, N. Y.
Office: Est. $1,000,000
Shroder & Koppel, 420 Lexington Ave.
New York, N. Y.
Store and Office: Est. $6,000,000
Shroder & Koppel, 420 Lexington Ave.
Pittsburgh, Pa.
Sewers: $409,070
Dunn and Ryan Constr. Co., 3918 Swineburn St.
West Virginia and Ohio
Bridge: $1,250,000
Nashville Bridge Co., Shelby Ave., Nashville, Tenn.
Brooklyn, N. Y.
Bulkhead Wall: $321,235
P. T. Cox Contg. Co., 154 Nassau St., New York City.
Paterson, N. J.
Airplane Factory: Est. $750,000
J. W. Ferguson Co., 152 Market St., Paterson.
New York, N. Y.
Warehouse: Est. $1,100,000
White Constr. Co., 95 Madison Ave.
Newark, N. J.
Department Store: Est. $750,000
Thompson Starrett Co., 250 Park Ave., New York.
Virginia and Maryland
Bridge: $1,250,000
McLean Contg. Co., Fidelity Bldg., Baltimore, Md.
Belleville, N. J.
Hospital, Nurses House, Etc.: $2,007,000
A. C. Windsor, 717 Broadway, Newark.
Somerset, N. J.
U. S. Veterans Hospital: $1,204,000
Murch Bros., Rivy, Exch. Bldg., St. Louis, Mo.

New England

Watertown, Conn.
Dormitories: Est. $1,000,000
James McWalters, 152 East 42nd St., New York City.
Roxbury, Mass.
Nurses Home and School: Est. $1,000,000
G. B. H. Macomber, 38 Chauncy St., Boston.
South Boston, Mass.
Fish Storehouse and Produce: $500,000
City Lease & Bldg. Corp., G. B. Long, Mgr., 11 Beacon St., Boston.
Cambridge, Mass.
Dormitories: Est. $2,500,000
L. D. Willcut & Sons Co., Boston.
Whidden-Beekman Co., Boston.
Somerville, Mass.
Meat Storehouse: $1,500,000
Turner Constr. Co., Boston.
Cambridge, Mass.
College Buildings: Est. $450,000
M. C. Tuttle Co., Park Sq. Bldg., Boston.

SEARCHLIGHT SECTION

EMPLOYMENT—BUSINESS OPPORTUNITIES—EQUIPMENT

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 5 cents a word, minimum $1.00 an insertion, payable in advance.

Positions Vacant and all other classifications, 10 cents a word, minimum charge $2.00.

Proposals, 50 cents a line an insertion.

INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals.)

DISPLAYED—RATE PER INCH:

1 inch $7.50
2 to 3 inches..... 7.25 an inch
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An Advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.

C.M.

STEEL SHEET PILING

Bought. Sold. Rented.

WEMLINGER INC.

Service. Technical advice. Stocks on hand everywhere.

149 BROADWAY NEW YORK

STEEL SHEET PILING

Saves you money and trouble in Foundation, Cofferdam, and Sewer work.

Bought-Sold-Rented—Always carried in stock

LONG DISTANCE TELEPHONE: CENTRAL 0491

S·W·LINDHEIMER, Inc.

31 South Clarke St. CHICAGO

GREENSPON'S

ODEE Pipe for gas lines—factory-welded into double lengths, to cut field welding. Plain end and threaded pipe, with or without couplings. Casing in all sizes. *All ready for immediate Shipment from strategic centers.*

Jos. GREENSPON'S Sons
IRON & STEEL CO.
ST. LOUIS NEW YORK CITY
TULSA BORGER, TEX.
WHEATLAND, PA.

PIPE ·FOR ALL PURPOSES·

"Opportunity" Advertising:

Think *"SEARCHLIGHT"* First!

0100

—a second-hand Motor

—a two-year-old Plane

Yet It Broke A World's Endurance Record

(Following material quoted from New York World of May 27, 1929.)

Plane Aloft 7 Days, 4 Hrs., 32 Minutes, Ends Record Flight

FORT WORTH, Tex., May 26—After setting a new world record of 172 hours 32 minutes and 1 second for sustained flight, the monoplane Fort Worth glided safely down to earth here at 4:05 o'clock this afternoon (6:05 P. M., New York time). . . . If flyers ever were blessed with a perfectly performing ship and a motor that stood every test put to it, we are those two pilots. The Ryan brougham in which we made the trip has been in use two years and has carried thousands of passengers for commercial hops. The Wright Whirlwind motor in the Fort Worth was second-hand when placed in the ship less than two years ago. It has gone more that 50,000 miles without a forced landing.

GOOD SECOND-HAND EQUIPMENT

has an important part in all present-day industrial activity. When cost or delivery, or both, are urgent factors, don't let old prejudices prevent your giving it the consideration it deserves. Many dealers in second-hand equipment sell with guarantees that fully protect buyers. Some completely rebuild all equipment offered and their stocks include many types of the most modern items available.

If a *used* plane with a *second-hand* motor can help two aviators break an *endurance* record why not investigate what second-hand equipment can do *for you* in solving equipment problems within your budget limitations?

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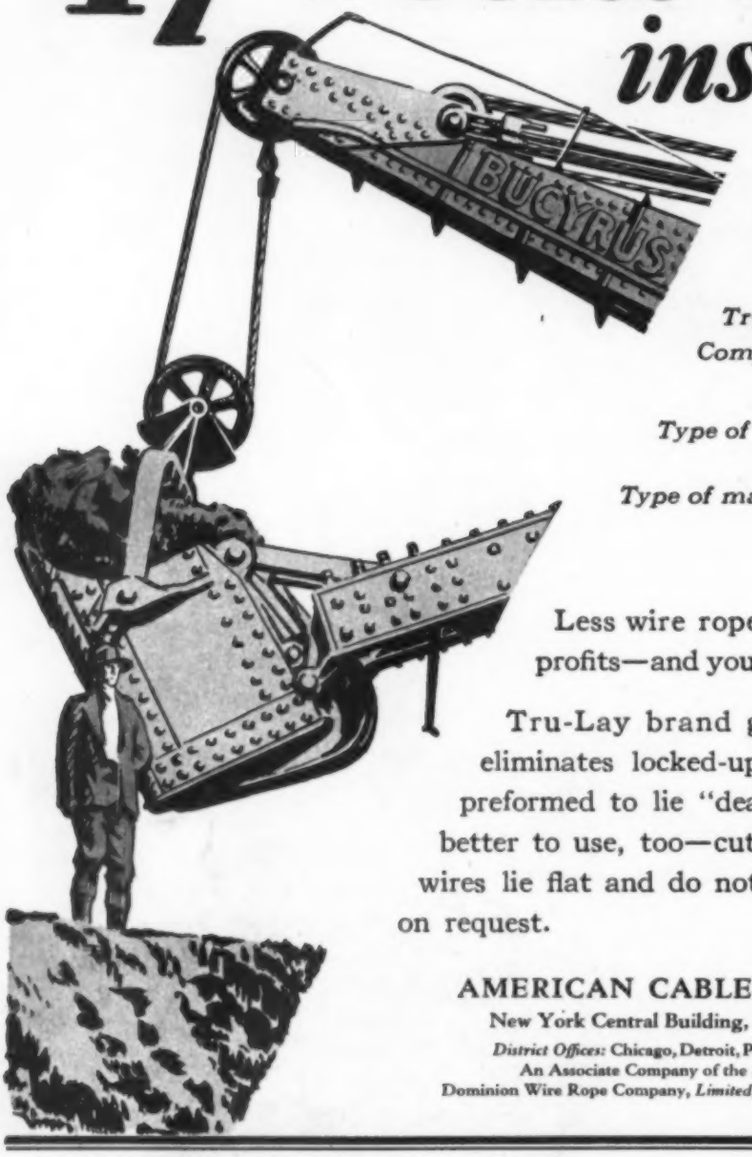
17 weeks' service *instead of* 8



125% increase on 6 yd. dredge.

Company: a Dredge Operating Company.

Rope Service

Tru-Lay: Average Service: 17 weeks.

Competitor's: Average Service: 6-8 weeks.

Rope Data

Type of rope: 1¼—6 x 19 construction—Grade—Improved Plow Steel.

Type of machine rope used on: Main hoisting cable on 6 cu. yd.-capacity Dipper Dredge.

Less wire rope used—less to buy—means more profits—and you want to make all the profit you can.

Tru-Lay brand gives increased service because it eliminates locked-up stresses. Each wire and strand is preformed to lie "dead" in the rope. Tru-Lay brand is better to use, too—cuts like bar—easier to splice—broken wires lie flat and do not snag workmen's hands. A sample on request.

AMERICAN CABLE COMPANY, *Incorporated*

New York Central Building, 230 Park Avenue, New York, N. Y.

District Offices: Chicago, Detroit, Philadelphia, Pittsburgh, Tulsa, San Francisco

An Associate Company of the American Chain Company, *Incorporated*

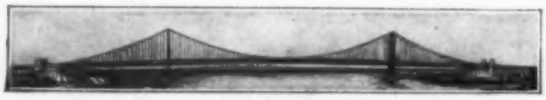
Dominion Wire Rope Company, *Limited*, Montreal, Sole Canadian Licensed Manufacturers

PREFORMED WIRE ROPE

TRADE **TRU-LAY** MARK

(Reg. U. S. Pat. Off.)

Detroit International Bridge



Philadelphia-Camden Bridge, The World's Greatest Suspension Bridge

Mt. Hope Bridge, Bristol, R. I.

American Cable is used on the World's Greatest Bridges

Dependable Power for Every Purpose

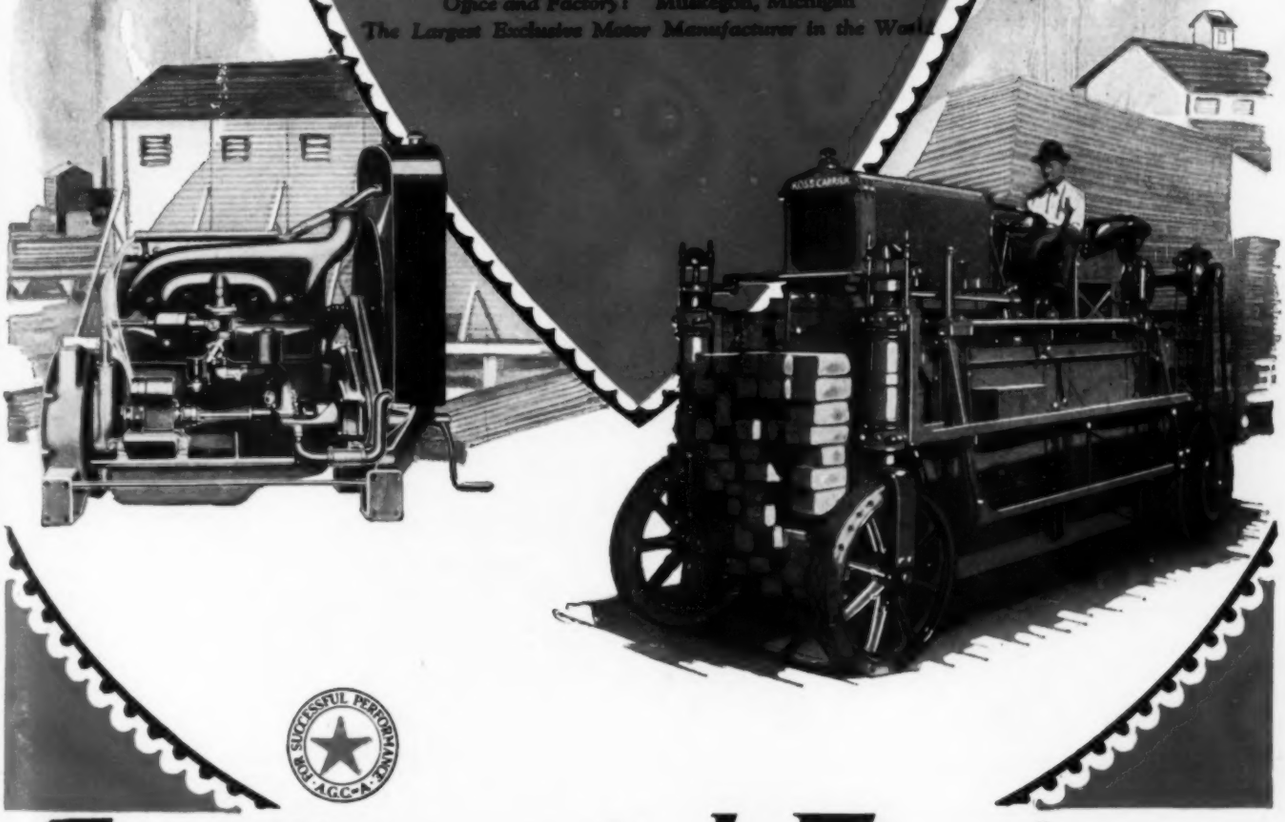
CONTINENTAL MOTORS — Power that Runs a Nation — AMERICA'S STANDARD

QUICK TRANSPORTATION

THE ease with which lumber and pipe can be transported with Ross Carriers, manufactured by The Ross Carrier Company, Benton Harbor, Mich., means proven economy in getting materials to jobs quickly. Hence, greater satisfaction for the builder, more business for Ross users.

The fact that these carriers are powered with heavy duty Continental Industrial Engines is a decided factor in the stability of this equipment.

CONTINENTAL MOTORS CORPORATION
INDUSTRIAL EQUIPMENT DIVISION
Office and Factory: Muskegon, Michigan
The Largest Exclusive Motor Manufacturer in the World



SUCCESSFUL PERFORMANCE — A.G.C. — A.E.

Continental Engines

No Grade too Steep
No Valley too Wide
for American Steel & Wire Company

AMERICAN
TRENTON-BLEICHERT SYSTEM *Aerial*
TRAMWAYS

Dependable and economical transportation system; low operating and maintenance costs; independent of weather conditions. No grades too steep; no distance too great; capacity practically unlimited.

In addition to our standard bicable tramways, we build single and double reversible tramways with automatic tripping carriages; also for very light capacity long lines we build single rope systems.

The illustration shows our Trenton-Bleichert Aerial Tramway built for the Atkinson, Kier Bros., Spicer Company and used by them in the construction of the Coolidge Dam at San Carlos, Arizona.

We shall be pleased to send descriptive literature on Aerial Tramways and furnish estimates and layouts on request.

Let our tramway engineers investigate your transportation problem.

Locked-coil Track Cables furnished on our Tramways. Minimum wear on cables and wheels.

American Steel & Wire Company

Subsidiary of United States Steel Corporation

208 S. LA SALLE STREET, CHICAGO — 30 CHURCH STREET, NEW YORK

Other Sales Offices: BOSTON CLEVELAND WORCESTER PHILADELPHIA PITTSBURGH BUFFALO DETROIT CINCINNATI BALTIMORE WILKES-BARRE ST. LOUIS KANSAS CITY MINNEAPOLIS-ST. PAUL OKLAHOMA CITY BIRMINGHAM ATLANTA MEMPHIS DALLAS DENVER SALT LAKE CITY

U. S. Steel Products Company: SAN FRANCISCO LOS ANGELES PORTLAND SEATTLE

Export Distributors: UNITED STATES STEEL PRODUCTS COMPANY, 30 CHURCH STREET, NEW YORK, N. Y.